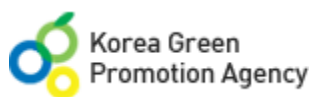


# Guidebook for Forestry Investments in Brazil

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by Jose Rente Nascimento

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## Presentations and Acknowledgements

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## Abbreviations and Acronyms

<b>ABC Program</b>	Low Carbon Agriculture Program
<b>ABRAF</b>	Brazilian Association of Plantation Forest Producers
<b>AC</b>	Acre State
<b>AL</b>	Alagoas State
<b>AM</b>	Amazonia State
<b>AMCHAM</b>	American Chamber of Commerce for Brazil
<b>AMS</b>	Minas Gerais Silviculture Association
<b>AP</b>	Amapá State
<b>APA</b>	Environmental Protection Area
<b>APEX-Brasil</b>	Brazilian Agency for Export and Investment Promotion
<b>APP</b>	Permanently Protected Areas
<b>AVL</b>	Agriculture Vocation Land
<b>BA</b>	Bahia State
<b>BCB</b>	Brazilian Central Bank
<b>BFS</b>	Brazilian Forest Service
<b>BM&amp;FBOVESPA</b>	Brazilian Stock Exchange
<b>BNDES</b>	Brazilian Development Bank
<b>CAN</b>	National Confederation of Agriculture
<b>CE</b>	Ceará State
<b>CEEMA</b>	Center for Economics, Environment and Agriculture Studies
<b>CERFLOR</b>	Brazilian Forest Certification Scheme
<b>CGFLOP</b>	Public Forest Management Commission
<b>CIDE</b>	Contribution for Intervention in the Economic Domain
<b>CIORD</b>	Territorial Management Integrated Center
<b>CNI</b>	National Confederation of Industries
<b>CONAB</b>	National (food) Supply Company

<b>CONAFLOR</b>	National Forest Commission
<b>CONAMA</b>	National Environmental Council
<b>CPI</b>	Corruption Perception Index
<b>CVM</b>	Brazilian Securities Exchange Commission
<b>DF</b>	Federal District
<b>EIA/RIMA</b>	Environmental Impact Study and Report
<b>EMBRAPA</b>	Brazilian Agricultural Research Corporation
<b>EMBRATER</b>	Brazilian Enterprise of Technical Assistance and Rural Extension ()
<b>ES</b>	Espirito Santo State
<b>EU</b>	European Union
<b>FAO</b>	United Nations Food and Agriculture Organization
<b>FCO</b>	Constitutional Fund for Center - West Brazil
<b>FDI</b>	Foreign Direct Investment
<b>FIAS</b>	Foreign Investment Advisory Service
<b>FINAME</b>	Special Agency for Industrial Financing, a branch of BNDES
<b>FNE</b>	Constitutional Fund for Northeast Brazil
<b>FNO</b>	Constitutional Fund for North Brazil
<b>FOB</b>	Free on Board
<b>FSC</b>	Forest Stewardship Council
<b>FVL</b>	Forest Vocation Land
<b>GCF</b>	Gross Capital Formation
<b>GDP</b>	Gross Domestic Product
<b>GHG</b>	greenhouse gases
<b>GNI</b>	Gross National Income
<b>GNP</b>	Gross National Product
<b>GO</b>	Goiás State
<b>GoB</b>	Government of Brazil
<b>HDI</b>	Human Development Index

<b>IAIF</b>	Forest Investment Attractiveness Index
<b>IAIF-BR</b>	Forest Investment Attractiveness Index for Brazilian States
<b>IAIF-FN</b>	IAIF-BR for native forests
<b>IAIF-FP</b>	IAIF-BR for planted forests
<b>IBAMA</b>	Brazilian Institute of Environment and Renewable Natural Resources
<b>IBGE</b>	Brazilian Institute for Geography and Statistics
<b>IBRD</b>	International Bank for Reconstruction and Development. Also WB
<b>ICMBio</b>	Chico Mendes Institute for Biodiversity Conservation
<b>ICSID</b>	International Center for the Settlement of Investment Disputes
<b>IDA</b>	International Development Association
<b>IDB</b>	Inter-American Development Bank
<b>IFAD</b>	International Fund for Agriculture Development
<b>IFC</b>	International Finance Corporation
<b>IICA</b>	Inter-American Institute for Cooperation on Agriculture
<b>ILO</b>	International Labor Organization
<b>IMF</b>	International Monetary Fund
<b>INCRA</b>	National Land Reform and Settlement Institute
<b>INDI</b>	Minas Gerais State Investment Promotion Agency
<b>INPE</b>	Space Research National Institute
<b>INPI</b>	National Institute of Industrial Property
<b>IOF</b>	Tax on Financial Transactions
<b>IPI</b>	Excise tax
<b>IRPJ</b>	Individual Income Tax
<b>ISO</b>	International Organization for Standardization
<b>ITTO</b>	International Timber Trade Organization
<b>KGPA</b>	Korean Green Promotion Agency
<b>LAC</b>	Latin America and the Caribbean
<b>LI</b>	Installation License

<b>LO</b>	Operational License
<b>LP</b>	Pre-Licensing
<b>LWC</b>	Light-Weight-Coated
<b>MA</b>	Maranhão State
<b>MAPA</b>	Ministry of Agriculture, Livestock and Food Supply
<b>MDA</b>	Agrarian Development Ministry
<b>MDF</b>	Medium-density fiberboard
<b>MDIC</b>	Ministry of Development, Industry and Foreign Trade
<b>Mercosul</b>	Southern Common Market
<b>MG</b>	Minas Gerais State
<b>MIGA</b>	Multilateral Investment Guarantee Agency
<b>MMA</b>	Ministry of Environment of Brazil
<b>MRE</b>	Ministry of External Relations
<b>MS</b>	Mato Grosso do Sul State
<b>MT</b>	Mato Grosso State
<b>NFI</b>	National Forest Inventory
<b>NFIS</b>	National Forest Information System
<b>nFVL</b>	Non forest Vocation Land
<b>NGO</b>	Non-Governmental Organization
<b>NYK</b>	Nippon Yusen Kaisha
<b>OECD</b>	Organization for Economic Cooperation and Development
<b>PA</b>	Pará State
<b>PAC</b>	Growth Acceleration Program
<b>PB</b>	Paraíba State
<b>PE</b>	Pernambuco State
<b>PI</b>	Piauí State
<b>PND</b>	National Development Plan
<b>PNF</b>	National Forest Program

<b>PNMC</b>	National Policy on Climate Change
<b>PPP</b>	Purchasing Power Index
<b>PPP</b>	Public-Private Partnership
<b>PR</b>	Paraná State
<b>PREVFOGO</b>	National Center for the Prevention and Combat of Forest Fires
<b>PROMECIF</b>	Forestry Investment Business Climate Improvement Process
<b>PRONAF</b>	National Program for Family Agriculture Strengthening
<b>R&amp;D</b>	Research and Development
<b>REDD+</b>	Reducing emissions from deforestation and forest degradation
<b>RENAI</b>	National Investment Information Network
<b>RJ</b>	Rio de Janeiro State
<b>RL</b>	Legal Reserve
<b>RN</b>	Rio Grande do Norte State
<b>RO</b>	Rondônia State
<b>RR</b>	Roraima State
<b>RS</b>	Rio Grande do Sul State
<b>SC</b>	Santa Catarina State
<b>SE</b>	Sergipe State
<b>SEAPA</b>	Agriculture, Livestock, and Warehousing Secretariat for Minas Gerais
<b>SEDR</b>	Secretariat for Extractivism and Sustainable Rural Development
<b>SELIC</b>	Special Clearance and Escrow System
<b>SFB</b>	Brazilian Forest Service
<b>SFN</b>	National Financial System
<b>SIF</b>	Forestry Research Society
<b>SISNAMA</b>	National Environmental System
<b>SMCQ</b>	Secretariat of Climate Change and Environmental Quality
<b>SNUC</b>	National Protected Areas System
<b>SP</b>	São Paulo State

<b>SUDAM</b>	Amazonian Development Agency
<b>SUDECO</b>	Center-West Development Agency
<b>SUDENE</b>	Northeast Development Agency
<b>SWOT</b>	Strength Weakness Opportunities Threatens
<b>TAC</b>	Conduct Adjustment Commitment
<b>TAC</b>	Conduct Adjustment Commitment
<b>TCSP</b>	Policy Assistance Support Service (FAO)
<b>TNC</b>	Trans National Corporation
<b>TO</b>	Tocantins State
<b>UFV</b>	Federal University of Viçosa
<b>UnB</b>	University of Brasilia
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDP</b>	United Nations Development Program
<b>USD</b>	Dollars of the United States of America
<b>WB</b>	The World Bank. Also IBRD.
<b>WEF</b>	World Economic Forum
<b>WIR</b>	World Investment Report
<b>ZEE</b>	Economic-Ecologic Zoning

## Units and Measures

<b>°C</b>	Degrees Centigrade
<b>°F</b>	Degrees Fahrenheit
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>ha</b>	Hectare
<b>KG</b>	Kilogram
<b>m<sup>3</sup></b>	Cubic meters

<b>mt</b>	Metric Ton
<b>R\$</b>	Reais (Brazilian Currency)
<b>USD</b>	U.S. Dollar. Same as US\$



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## Introduction

Brazil is an upper middle income country with the fifth largest area in the world, a GDP of USD 2.253 trillion, and a population of more than 200 million.

The country is one of the world giants of mining, agriculture, and manufacturing, and it has a strong and rapidly growing service sector. It is a leading producer of a host of minerals, including iron ore, tin, bauxite (the ore of aluminum), manganese, gold, quartz, and diamonds and other gems, and it exports vast quantities of steel, automobiles, electronics, and consumer goods. Brazil is the world's primary source of coffee, oranges, and cassava (manioc) and a major producer of sugar, soy, forest products, and beef; however, the relative importance of Brazilian agriculture has been declining since the mid-20th century when the country began to rapidly urbanize and exploit its mineral, industrial, and hydroelectric potential. (Encyclopædia Britannica, 2014)

In comparison with other countries, Brazil is the second in area of native forests, has the greatest stock of carbon in the living forest biomass and is 8<sup>th</sup> in area of planted forests. (Serviço Florestal Brasileiro, 2013)

However, Brazil is the world's largest producer of industrial roundwood from forest plantations which indicates their high productivity. A recent FAO publication (Jurgensen, Kollert, & Lebedys, 2014), using data for 2012 obtained from 78 countries, found Brazil to be the world's top producers of industrial roundwood based on forest plantations. On that year, Brazil's plantations produced 131.9 million m<sup>3</sup> of roundwood, double what the second largest producer; China produced (64.2 million m<sup>3</sup>).

This report was commissioned by the Korean Green Promotion Agency to develop a practical guide to itself and to partner Korean investors in the process of understanding and evaluating possible investments in forests plantations in the Brazil. The report reviews current status regarding forest resource development especially industrial plantation, bio-energy plantations, and clarify issues related to the business environment for plantation investments in Brazil.

For this, the report is divided in 7 sections. The first section provides an overall view of Brazil in terms of history, political and governance organization, natural environment, population, the economy, the general business climate for foreign direct investments, and investment supporting institutions.

Section two presents the current state of forests and forestry in Brazil, with especial emphasis on plantation forest as and the business climate particularly for forest investments in Brazil as it compares to other Latin American countries. It also discusses the different climates for investment in forest based businesses found for the individual states which make up the Brazilian territory.



Section three presents the legal, institutional, and procedural issues related to the development of forest resources businesses in the country, including those related to land access, land use conditions, and forest plantation legal requirements.

The fourth section presents issues related to general environmental licensing in Brazil, including legal, institutional, procedural, and liability considerations.

Section five presents a SWOT (Strength, Weaknesses, Opportunities and Threats) analysis for a forest plantation investment by a Korean company in Brazil as well as the recommendation measures to overcome the threats found.

The sixth section presents several cases of successful and well established forest plantation related companies in Brazil. These companies cover a wide range of forest products, including pellets and chips for export, charcoal as an input into the steel production, fiberboards for the construction and furniture industries, and pulp and paper.

The last section presents some conclusions and suggestions regarding the forest plantation investment opportunities in Brazil.

## General Information

This section presents an overall view of Brazil. It is made up of eight parts. Part one presents a table with some basic numbers and information that characterizes general aspects of the country.

Part two describes briefly the country's history while part three presents general aspects of its political system and organization by explaining the structure and roles of the legislative, executive, and judiciary branches of government as well as the structure and roles of states and municipal institutions.

The third part presents Brazil's natural environment concentrating on the features of the terrain, the climate and soils. Vegetation features are discussed in the following sections of the report.

Part four describes the basic characteristics of Brazilian population.

The fifth part presents Brazil's economy by describing its resources, agribusiness, industry, trade, financial system, taxation issues, labor issues, and transportation infrastructure.

Part six discusses the overall conditions for successful business in Brazil especially as they relate to direct foreign investments.

The last part indicates and describes government organizations that support investors in their decisions at federal level and for the states of Minas Gerais and São Paulo.

## Basic Data and Information About Brazil

Brazil is an upper middle income country with the fifth largest area in the world, a GDP of USD 2.253 trillion, and a population of more than 200 million. This section presents a brief description of basic information about Brazil in terms of its history, political system, Legal system, economic indicators, population, and natural features. Table 1 and this section summarize some basic facts and information about the country.

Brazil is a federal republic divided into 26 states and the Federal District (Distrito Federal), the latter including the capital city, Brasília. Since 1934 the nation has had universal suffrage. In 1988 Brazil promulgated a new constitution—the eighth since the country's independence in 1822—that abolished many traces of the military regime (1964–85), defined civil rights, and outlined the functions of the executive, legislative, and judicial branches. It restricted the president's power to



legislate, proscribed government censorship of the arts, condemned the use of torture, prohibited extradition for political crimes, set the minimum voting age at 16 years, and allowed the federal government to intervene in state and local affairs. The constitution has been amended several times since its promulgation, but some of the changes have been temporary, with specifically designated timespans.

**Table 1 - Basic Facts and Information About Brazil**

<b>Official Name</b>	Federative Republic of Brazil
<b>Nationality</b>	Brazilian
<b>Capital</b>	Brasilia
<b>Official Language</b>	Portuguese
<b>Ethnic groups</b>	Portuguese, Italian, German, Spanish, Japanese, Arab, African, and indigenous people
<b>Religion</b>	Roman Catholic (74%)
<b>System of Government</b>	A Federative Republic with a multi-party political system. Brazil holds democratic elections for president, senators, representatives, state governors and legislators, mayors and municipal councils
<b>Geography</b>	Brazil is in east-central South America and occupies nearly 50% of the South American continent. Around 58% of Brazil is covered with forests, which include the largest rainforest in the world, located in the Amazon River basin. The country has eight river systems, which carry approximately 20% of the world's fresh water.
<b>Number of states and municipalities</b>	26 states and the Federal District, and 5.570 municipalities.
<b>Money</b>	The official currency is the Real, which is divided into 100 centavos
<b>Main Products</b>	Aircraft, bauxite, beef, cellulose, cereals, coffee, cocoa, crude oil and petrochemicals, diamonds, furniture, gold, households appliances, hydroelectric power engines, iron ore, manganese, motor vehicles, nickel, orange juice, phosphates, platinum, processed food, quartz crystals, rubber, shoes, silver, soybeans, steel, sugar, textiles, timber, tin, titanium, uranium and zinc
<b>GDP</b>	(current) USD 2.253 trillion 2012

<b>GDP growth in 2012</b>	2.4%
<b>GNI in 2012</b>	USD2,218 trillion (current)
<b>GNI growth in 2012</b>	1.24%
<b>GNI per capita in 2012</b>	USD 21.815 (current LCU)
<b>Unemployment rate</b>	6.7% (2011)
<b>Inflation</b>	6.2% (2013)
<b>Exports</b>	USD242 billion (FOB) - 2013
<b>Imports</b>	USD239 billion (FOB) - 2013
<b>Foreign direct investment, net inflows</b>	USD76 billion (Current 2012)
<b>Brazil-S. Korea trade</b>	Total of USD14 billion; Brazil exported 4.7 billion (FOB) and imported 9.5 billion (FOB)
<b>Urban population</b>	84,6% urban (2010)
<b>Sex Distribution</b>	48.97% male, 51.03% female (2010)
<b>Age Breakdown</b>	24.08% under 14, (2010) 68,54% 15 to 64, 7,38% 65 and over
<b>Life expectancy at birth, total</b>	74 years (in 2012)

Sources: (The World Bank, 2014a), (IBGE, 2014), (IBGE, 2014a), (IBGE, 2014b)

## Brief History<sup>1</sup>

Brazil was discovered in 1500 by the Portuguese navigator Pedro Álvares Cabral and remained a Portuguese colony for over 300 years. Brazil declared its independence in 1822, when a constitutional monarchy was established. A federal republic was proclaimed in 1889, and democratic administrations have been interrupted twice since. From 1930 to 1945 the country was

<sup>1</sup> Heavily based in (Government of Brazil, 2014) and (PricewaterhouseCoopers, 2010)

subject to the civilian dictatorship of Getúlio Vargas. Subsequently in 1964, following political, economic and social unrest, a new administration was established by the military and considerable economic growth and development was achieved during the next 20 years, although not without political and social repercussions. Democracy was restored in 1985.

A new constitution was enacted by Brazil's National Congress in 1988, which upheld the presidential system while simultaneously decentralizing political power. The Constitution is lengthy, consisting of 250 permanent articles and 94 provisional articles. In recognition of possible flaws in the wording, the Constituent Assembly made an express provision for its review. This review is behind schedule, although several amendments have already been approved but yet to be regulated.

The 1980s was a period of economic instability across Latin America due to the energy shocks and ensuing sovereign debt crises that saw many countries in the region – including Brazil – struggle to balance public finances. Most of Brazil's governments during this period struggled to contain hyperinflation, but at the same time important structural reforms were carried out by opening Brazil to international trade and beginning to liberalize sectors of the economy to encourage private sector initiatives.

In 1994 a successful formula for ensuring economic stability was achieved. Brazil introduced a new currency – the real – and created a macroeconomic framework aimed at inflation-targeting, fiscal responsibility and insulating the economy from external shocks. This plan – called the Real Plan – laid the foundations on which Brazil's subsequent economic growth has been built.

The first decade of the new century was defined by many great achievements for Brazil, but perhaps the single most transformational moment came through the efforts to improve the quality of life for the poorest members of Brazilian society. During this period, 40 million Brazilians entered Brazil's middle class, with access to social housing, electricity, education and food.

## **Organization and Political System**

The federal republic has three independent branches: executive, legislative and judicial. The President heads the executive branch and oversees a number of executive departments, the heads of which are appointed and are known collectively as the Cabinet. The Cabinet is answerable to the President. Unlike in many parliamentary democracies, its members need not be members of the legislative branch. Besides the executive departments, there are a number of independent agencies, many of which are regulatory. Legislative power is exerted by a National Congress consisting of a Senate and a House of Representatives. There are 81 senators, three from each state and the Federal District of Brasilia. The total membership of the House is 513 and each state's number of representatives is determined by its population. Voting is compulsory at the age of 18, but 16- and 17-year-olds, the over-70s and the illiterate can opt to vote. There are many political parties, although ideologies are not clearly developed. (Government of Brazil, 2014)



## The legislature<sup>2</sup>

Legislative power is exercised by the bicameral National Congress (Congresso Nacional), comprising the Chamber of Deputies (Câmara dos Deputados) and the Federal Senate (Senado Federal). Congress meets every year in two sessions of four and a half months each. The constitution gives Congress the power to rule in matters involving the federal government, particularly those related to fiscal policies and to the administration of the union. Congress also ratifies international treaties negotiated by the executive, authorizes the president to declare war, and decides whether or not the federal government may intervene in the affairs of the states. If the president vetoes a congressional bill or any of its provisions, Congress has 30 days to overrule the veto by an absolute majority vote.

The Chamber of Deputies consists of representatives of the states elected every four years by direct universal suffrage. The number of deputies is in rough proportion to the population of each state, but no state can be represented in the chamber by more than 70 or by fewer than eight deputies. This system grants a disproportionate share of political power to the states of the Northeast and North and severely underrepresents the heavily populated state of São Paulo.

The 81-seat Federal Senate is composed of three representatives from each state and the Federal District who serve eight-year terms. Senatorial elections are held every four years, alternating between one-third (27) and the remaining two-thirds (54) of the seats. Senators are directly elected by the residents of each state.

## The executive<sup>3</sup>

Executive power is exercised by the president, who is head of state and government, is directly elected to a four-year term (and is eligible for one reelection), and appoints a cabinet of various ministers of state and several other heads of ministerial-level departments. The executive has wide powers, particularly in economic and foreign policy, finances, and internal security. The president can submit bills to Congress and request legislative approval within 30 days; if Congress does not comply within this period, the bill is considered approved. The president can partly or totally veto any bill submitted by Congress in addition to issuing provisional measures that remain in effect for 30-day periods. The president is also commander in chief of the armed forces; in practice, however, civil-military relations in Brazil have never been taken for granted.

<sup>2</sup> (Encyclopædia Britannica, 2014)

<sup>3</sup> (Encyclopædia Britannica, 2014)



## Legal system and Justice<sup>4</sup>

The principal source of Brazilian civil law is the Civil Code, which dates from 2002, and subsequent legislation. The legal system is slow and cumbersome. The judicial branch consists of a system of federal, state and local courts throughout the country, headed by the Federal Supreme Court. The federal courts rule on the constitutionality of laws and decisions appealed from the lower courts to which the Federal Union is party. The Supreme Court's decisions are final and cannot be appealed. The state and municipal courts act independently of the federal courts, within the bounds of the Constitution. State governments follow a pattern similar to that of the federal government. Each state has a governor as chief executive and power is divided among the state executive, legislative and judicial branches. (Government of Brazil, 2014)

The Brazilian judicial system is divided into two branches: the ordinary branch, made up of state and federal courts, and the special branch, made up of labour, electoral, and military courts.

The Supreme Federal Court (Supremo Tribunal Federal) is Brazil's highest court. It is composed of 11 members nominated by the president with the approval of the Federal Senate. The court provides final rulings on constitutional issues and hears cases involving the president, the vice president, Congress, the judiciary, the attorney general, government ministers, diplomats, foreign countries, and the political or administrative divisions of the union.

The Higher Court of Justice (Superior Tribunal de Justiça) consists of 33 judges appointed by the president with the approval of the Senate. It is the highest court in the land regarding nonconstitutional matters and also hears cases involving governors of the states and the Federal District. The ordinary branch also includes federal courts of appeal known as Regional Federal Courts. Each state has state and federal courts that exercise first-instance jurisdiction.

Of the special branch courts, electoral courts are responsible for the registration of political parties and the control of their finances. They also select the date of elections and hear cases involving electoral crimes. Labour courts mediate in conflicts between management and workers, and military courts have jurisdiction in cases involving members of the armed forces.

Although the Brazilian judicial system has long been criticized for inefficiency, incidents of political favouritism, and widespread corruption, efforts have been made to reform it, including, most notably, the adoption in 2004 of Constitutional Amendment 45. That amendment established the principle of *stare decisis*, under which high courts' decisions were to be considered binding precedents, with the intention of increasing the efficiency of lower courts. The amendment also created the National Council of Justice, an external institution to oversee compliance with judicial rules and to consider complaints against judges. Within the country's prisons, harsh and overcrowded conditions have often incited mass escape attempts and riots, during which many prisoners have been killed.

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<sup>4</sup> (Encyclopædia Britannica, 2014)

## Regional, state, and local administration<sup>5</sup>

Brazil is a federation of states which are divided in municipalities. Map 1 shows the geopolitical division of the country highlighting the location of the states.

The states are semi-autonomous with their own constitutions, justice systems, and directly elected governors and legislative assemblies. The Federal District has been administered by a directly elected governor since the 1990s; previously, the president had appointed a mayor (prefeito) to oversee the district.

Brazil is also subdivided into more than 5,000 municipalities (municípios) that are created by the states according to federal guidelines. The municipalities, which are similar to counties and may cover urban or rural zones, have their own fiscal resources and autonomous governments, including directly elected mayors and municipal councilors. Major cities are generally state capitals, and relations between governors and mayors are often pervaded by bureaucratic rivalries.

The federal government does not provide for separate regional administrations, although it promotes economic growth in the poorer regions through agencies known as the superintendencies for the development of the Northeast, or SUDENE (founded 1959), and of the Amazon region, SUDAM (1966). SUDENE and SUDAM grant federal funds to development projects and oversee tax incentives that are intended to stimulate local and regional investment; however, the policies of the agencies have varied significantly under different federal administrations, and agency functions frequently overlap, especially at the local level.

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<sup>5</sup> (Encyclopædia Britannica, 2014)

# Map 1 - Geopolitical Division of Brazil



Source: IBGE.

## Natural environment

The Brazilian landscape is immense and complex, with interspersed rivers, wetlands, mountains, and plateaus adjoining other major features and traversing the boundaries of states and regions.

### Overview

The Brazilian government has grouped the country's states into five large geographic and statistical units called the Major Regions (Grandes Regiões): North (Norte), Northeast (Nordeste), Central-West (Centro-Oeste), Southeast (Sudeste), and South (Sul). The tropical North—comprising the states of Acre, Rondônia, Amazonas, Pará, Tocantins, Roraima, and Amapá—covers more than two-fifths of Brazilian territory and includes the largest portion of Amazon rainforest and parts of the Guiana and Brazilian highlands; however, the region accounts for a limited proportion of the nation's population and economic output.

The Northeast, which experiences some of the nation's driest and hottest conditions, has nearly one-fifth of Brazil's land area and more than one-fourth of the population. It contains the states of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Alagoas, Sergipe, Bahia, and Pernambuco, the latter including the island of Fernando de Noronha, some 225 miles (360 km) off the Atlantic coast. The region's oldest cities date from the 16th century, when the Portuguese first established sugarcane plantations there. The Northeast accounts for one-fifth of the nation's agricultural production, but the industrial and service sectors lag far behind those of the Southeast and South, and the unemployment rate remains high.

The Southeast covers only one-tenth of Brazil's territory but has two-fifths of its population and the greatest concentration of industrial and agricultural production in the nation. The region includes São Paulo state, which is the nation's economic and demographic heartland, landlocked Minas Gerais, whose very name (meaning “Extensive Mines”) testifies to great mineral wealth, and the populous coastal states of Espírito Santo and Rio de Janeiro. The city of Rio de Janeiro, the national capital from 1763 to 1960, remains Brazil's main cultural and tourist centre.

The South, which stretches below the Tropic of Capricorn, includes the states of Paraná, Santa Catarina, and Rio Grande do Sul. It occupies an area nearly as large as the isle of Britain but is the smallest of Brazil's regions. Its diversified economy includes strong manufacturing, agriculture, and service sectors. The South has about one-seventh of the nation's population, including many people of European ancestry, particularly from Germany and Italy. The South's tourist trade partly depends on the spectacular Iguaçu Falls, at the Argentine border.

The Central-West consists of the states of Goiás, Mato Grosso, and Mato Grosso do Sul, as well as the Federal District, in which Brasília is located. The region covers roughly one-fourth of Brazil, including forested valleys, semiarid highlands, and vast wetlands. A small proportion of the nation's population lives there, but an increasing number of settlers have been moving into the region and extending its agricultural frontiers.



## Terrain<sup>6</sup>

Brazil is a predominantly tropical country famous for its extensive Amazon lowlands; however, highlands cover most of the national territory. Brazil's physical features can be grouped into five main physiographic divisions: the Guiana Highlands in the North, the Amazon lowlands, the Pantanal in the Central-West, the Brazilian Highlands (including the extensive coastal ranges), and the coastal lowlands.

Brazil's topography is dominated by flat lands. Around 62% of the total area of the country or 525 million ha have less than 8% steepness of slopes while only 3% of the lands have very steep slopes superior to 30%. Annex 8 shows a comparison of steeplands in selected Latin American and Caribbean Countries. Map 2 shows the topography of the country. For a more detailed view of the topography of the specific sites using satellite imagery, go to (EMBRAPA, 2014).

**Map 2 - Topographic Map of Brazil**



Source: IBGE

<sup>6</sup> (Encyclopædia Britannica, 2014)



## Guiana Highlands

Brazil shares the rugged Guiana Highlands with Venezuela, Guyana, Suriname, and French Guiana. Forested mesas and mountain ranges, scenic waterfalls, and white-water rivers characterize the area. The highest point in Brazil is Neblina Peak, which reaches 9,888 feet (3,014 meters) along the Venezuelan border in the Serra do Imeri. The Serra da Pacaraima, farther east, rises to 9,094 feet (2,772 meters) at Mount Roraima, where the borders of Venezuela, Guyana, and Brazil meet. The less rugged Acaraí and Tumuc-Humac (Tumucumaque) ranges border on the Guianas.

### Amazon lowlands

The Amazon lowlands are widest along the eastern base of the Andes. They narrow toward the east until, downstream of Manaus, only a narrow ribbon of annually flooded plains (*várzeas*) separates the Guiana Highlands to the north from the Brazilian Highlands to the south. The *várzeas* fan out again as the watercourse approaches the Atlantic, but no delta extends into the ocean. The basin's most widespread topographical features are gently undulating hills called terra firme ("solid ground"), composed of layers of alluvial soil that were deposited as much as 2.5 million years ago and subsequently uplifted to positions above flood level. Shallow oxbow lakes and wetlands are found throughout the region.

## Pantanal

The immense *Pantanal*, an extension of the Gran Chaco plain, is a region of swamps and marshes in northwestern Mato Grosso do Sul and southern Mato Grosso states and, to a lesser extent, in northern Paraguay and eastern Bolivia; it is one of the largest freshwater wetlands in the world, covering some 54,000 square miles (140,000 square km). The *Pantanal* is dissected by the effluents of the upper Paraguay River, which overflows its banks during the rainy season, inundating all but the tops of scattered levees and low hills.

## Brazilian Highlands

The Brazilian Highlands make up more than half of the country's landmass and are the main source of the nation's abundant mineral wealth. In Brazil the highlands are often called the *Planalto Central* (Central Highlands, or Central Plateau), but that term may be limited to the part of the highlands around Brasília and Goiás. The rugged highlands include steep cliffs, flat-topped plateaus, ravines, rolling hills, and rock outcrops; however, the region's maximum elevations are below 10,000 feet (3,000 meters). Its highest elevations are in two areas: the first along a series of ridges less than 300 miles (500 km) from the eastern coast, and the second in the environs of Brasília and the border dividing Bahia state from Tocantins and Goiás. The highlands to the north and west of Goiás extend for some 600 miles (1,000 km) until they descend into the Amazon lowlands. A massive escarpment marks the eastern edge of the Brazilian Highlands, extending along the coast for some 1,600 miles (2,600 km) and forming mountain ranges that average

approximately 2,600 feet (800 meters) in elevation, with many individual peaks rising above 7,000 feet (about 2,100 meters).

The major ranges of the northeastern highlands include the Serra Grande, which skirts the Piauí-Ceará border; the Araripe Upland (Chapado Araripe) in Pernambuco state; and the Diamantina Upland (Chapada Diamantina) in Bahia. The Serra do Espinhaço extends from central Minas Gerais into southern Bahia, where Almas Peak reaches 6,070 feet (1,850 metres). The Serra Geral de Goiás separates the states of Goiás and Tocantins to the west from Bahia to the east. Goiás state also includes some of the more elevated parts of the Planalto Central, the Serra dos Pirineus, and the Serra Dourada. The ranges and plateaus farther north and west, which are neither as elevated nor as deeply dissected as their eastern counterparts, include the mineral-rich Serra dos Carajás in eastern Pará state, the Serra do Cachimbo, mainly in southwestern Pará, and the Parecis Upland (Chapada dos Parecis), which stretches between Rondônia and Mato Grosso. Other highland regions of Mato Grosso state are sometimes collectively designated the Mato Grosso Plateau.

The Serra do Mar, averaging some 3,000 feet (1,000 meters) above sea level, is the largest segment of the escarpment along the Atlantic coast. The range extends from southeastern Minas Gerais to eastern Paraná; in the vicinity of Rio de Janeiro, where the range is also known as the Serra dos Orgãos, it presents an almost sheer face to the sea and creates the outcrops of Sugar Loaf (Pão de Açúcar) and Gávea and a string of small islands. The Serra da Mantiqueira, located just north of the Serra do Mar but still somewhat near the coast, marches southward from the Serra do Espinhaço; in southern Minas Gerais the Mantiqueira range reaches 9,143 feet (2,787 meters) at Agulhas Negras Peak on the Rio de Janeiro state border and 9,482 feet (2,890 meters) at Bandeira Peak, near the Serra dos Aimorés, which extends along the Minas Gerais–Espírito Santo border. A series of ridges southwest of the Serra do Mar is known as the Serra de Botucatu in São Paulo state and the Serra Geral from Paraná southward. The Iguaçu River in southwestern Paraná tumbles over a steep rim of diabase rock to form the spectacular Iguaçu Falls. Guaíra Falls on the Paraná River were a similar attraction until 1982, when the huge hydroelectric dam at Itaipú was completed and they were submerged.

### **Coastal lowlands**

The Atlantic lowlands, which comprise only a tiny part of Brazil's territory, range up to 125 miles (200 km) wide in the North but become narrower in the Northeast and disappear in parts of the Southeast. Nevertheless, their features are widely varied, including level floodplains, swamps, lagoons, sand dunes, and long stretches of white sandy beaches that are protected in some areas by coral reefs and barrier islands. Various deep harbours exist where the rocky slopes of the coastal ranges plunge directly into the ocean, such as at Guanabara Bay, where Rio de Janeiro and Niterói are located, and All Saints Bay, the site of Salvador; cities in these locations occupy small valleys or considerably narrow strips of land, but many poorer neighbourhoods occupy perilously steep ridges on the periphery. The coastal plain widens again in the South at the site of Patos Lagoon, one of the continent's largest lagoons, and Mirim Lagoon, along the Uruguayan border.

## Climate<sup>7</sup>

Brazil has a humid tropical and subtropical climate except for a drier area in the Northeast, sometimes called the drought quadrilateral or drought polygon, that extends from northern Bahia to the coast between Natal and São Luís; that zone receives about 15–30 inches (375–750 mm) of precipitation a year. Much of Brazil receives 40–70 inches (1,000–1,800 mm) annually, but precipitation often is much heavier in parts of the Amazon basin and the sea-facing rim of the Serra do Mar.

Rainfall period usually occurs from October to March, as can be seen in Map 4. However, this period is extended in the Amazon region and in Southern Brazilian states.

The central parts of the Brazilian Highlands receive most of their precipitation during the summer months (November to April), often in the form of torrential downpours. Storms and floods may strike the Northeast at that time, depending on weather patterns, but the region may also experience prolonged drought. These shifting conditions make life difficult in the *sertão*, the backlands of the Northeast, and are a major cause for migration out of the region. Summer temperatures are largely uniform. In January most of the lowlands average roughly 79 °F (26 °C), and the highlands are a few degrees cooler, depending on elevation. The coast of Rio Grande do Sul is also somewhat cooler, averaging around 73 °F (23 °C), whereas the Northeast backland's drought quadrilateral, the hottest region of the country, averages some 84 °F (29 °C), with daytime temperatures exceeding 100 °F (38 °C). However, the Northeast's low humidity makes the heat less oppressive than in Rio de Janeiro.

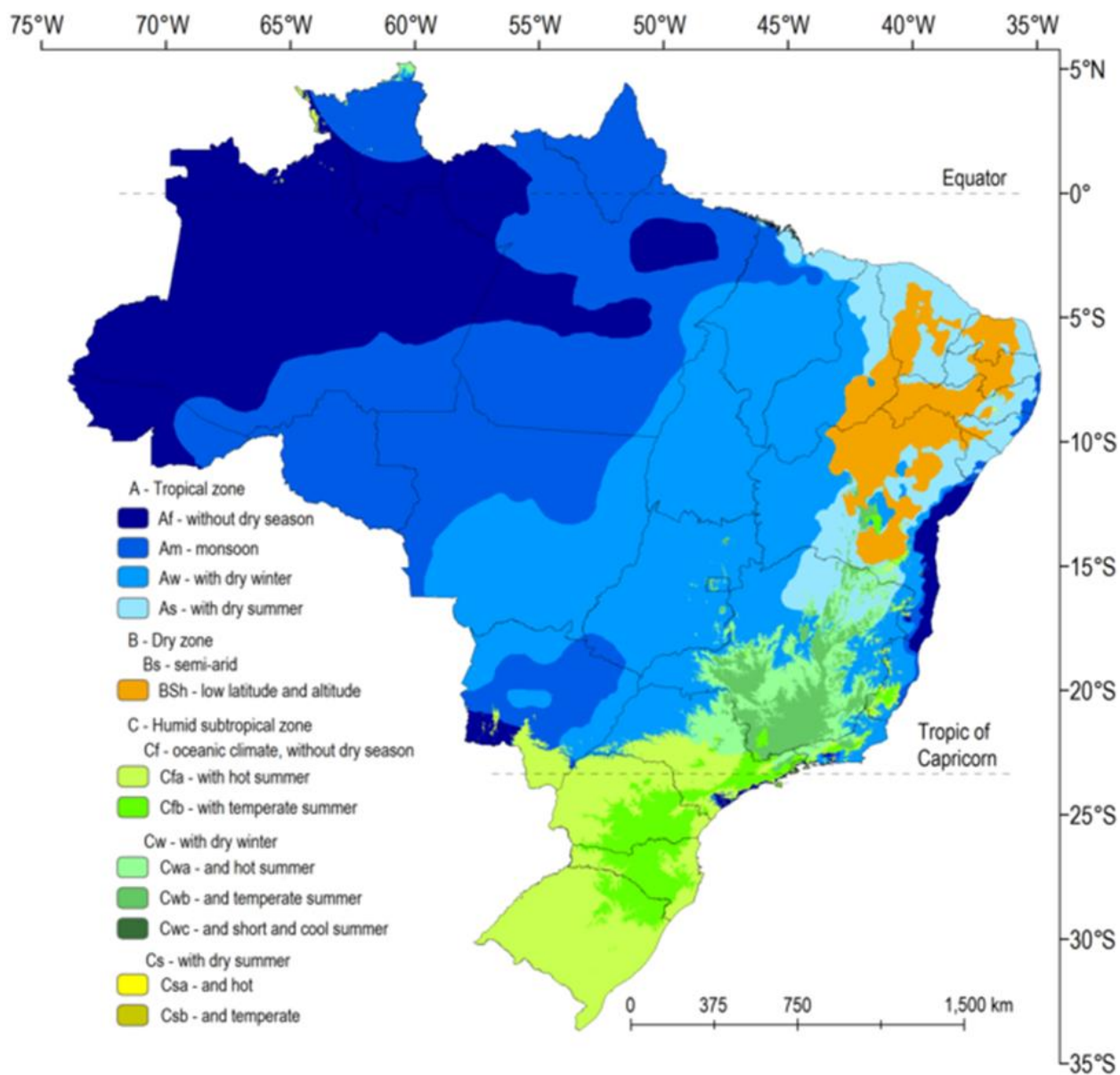
In the winter (May to October) the Brazilian Highlands are generally dry, and snow falls in only a few of the southernmost states. Regular frosts accompany winter air patterns from the south, and near-freezing temperatures can reach as far north as São Paulo. Cool, rainy weather may extend along the coast as far north as Recife and, in the west, to the Pantanal. Cool air occasionally spills over from the Paraguay lowlands into the western Amazon basin and may travel as far north as the Guyana border. Winter temperatures in the Amazon lowlands remain virtually unchanged from those of the summer months, but temperatures in the drought quadrilateral drop to about 79 °F (26 °C). Temperatures in the Brazilian Highlands average about 68 °F (20 °C) in the central and northern regions and are cooler toward the south: Curitiba, at an elevation of some 3,000 feet (900 m), averages 57 °F (14 °C) in June and July. During those months the mean temperature at Porto Alegre is the same, but Rio de Janeiro is much hotter, averaging 73 °F (23 °C), partly because of the warm currents that bathe the entire Brazilian coast.

For a more precise classification and description of Brazil's climate see Map 3.

<sup>7</sup> (Encyclopædia Britannica, 2014)

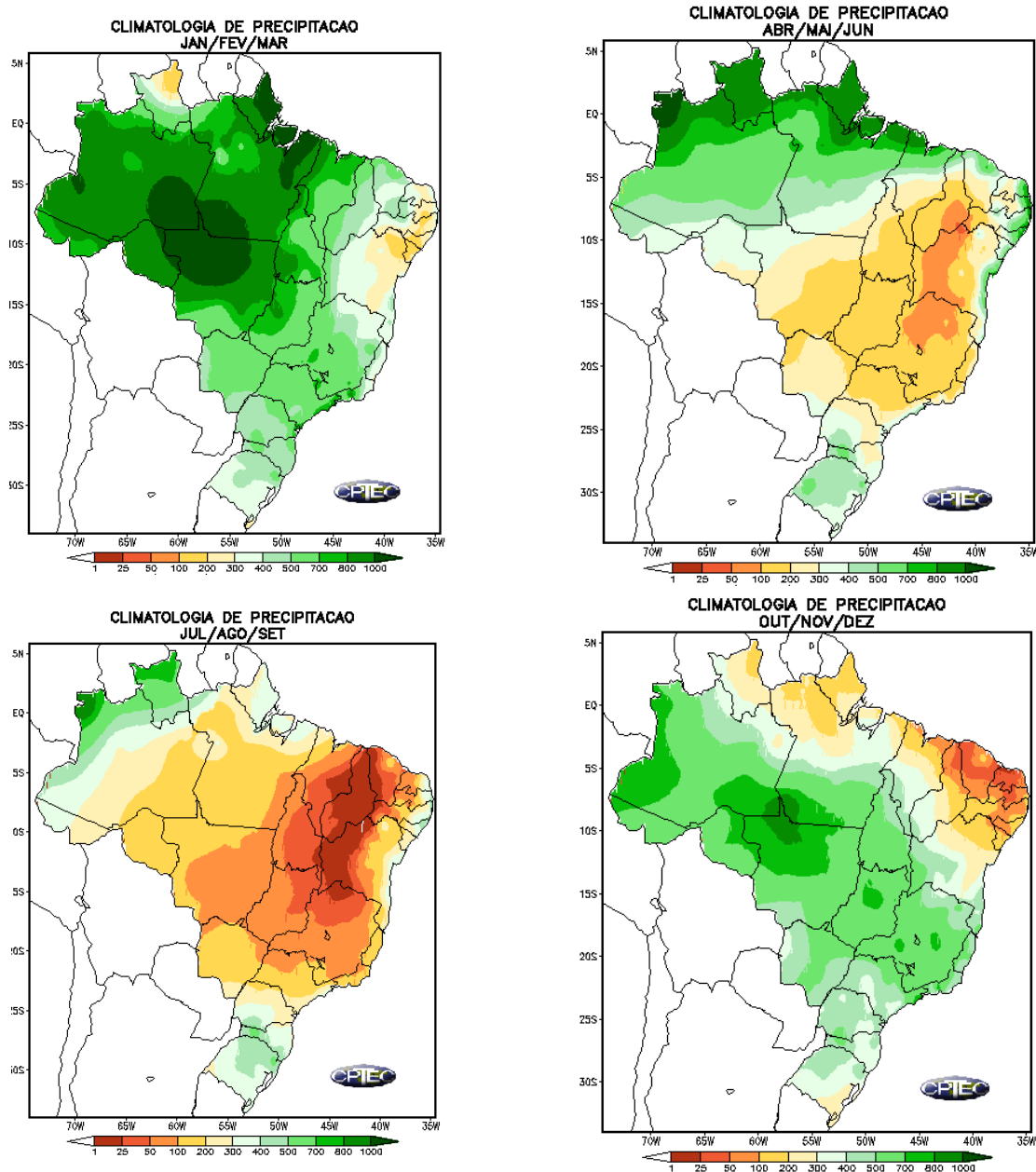


**Map 3 - Climate classification for Brazil, according to the Köppen criteria**



Source: (Alvares, Stape, Sentelhas, Leonardo, & Sparovek, 2013)

**Map 4 - Quarterly rainfall distribution in Brazil**



Source: (CPTEC, 2014)

## Soils

Brazil's soils form a vast and intermixed pattern. A large band of nutrient-rich, deep reddish purple soil (*terra roxa*) lies in the Southeast and South between central Rio Grande do Sul and southern

Minas Gerais, including large areas of Paraná and São Paulo states. That region contains Brazil's most heavily farmed lands; however, *terra roxa* is not necessarily more productive than soils in other regions of the country. Soils in the Northeast also contain many nutrients, but agriculture is limited there because few fields are irrigated. Heavy rainfall has intensely leached many soils, leaving them with few nutrients but with an overabundance of insoluble iron and aluminum silicates. Laterites (soils dominated by iron oxides) and other infertile soils are especially prevalent in the Brazilian Highlands, where they can reach depths of as much as 90 feet (27 metres).

Amazonian soils are also leached but not as deeply. In the *terra firme* of the rainforest, dead organic matter quickly decays and is recycled. However, once the overlying forest canopy is destroyed—e.g., by clear-cutting or burning—that regenerative cycle is interrupted, and many nutrients and organic matter are lost. More fertile Amazonian soils, interspersed between the zones of leached soil, include *várzea* alluvial deposits and *terra preta dos indios* ("black earth of the Indians"), which has developed throughout Amazonia on the sites of prehistoric settlements. (Encyclopædia Britannica, 2014)

Map 5 shows an overview map of the principal soil types of Brazil. For a map of soils of Brazil at a 1:5 000 000 scale, go to (IBGE, 2014g) and see Annex 1 for agriculture potential of soils map of Brazil.

For a description of the Brazilian soil classification system as well as electronic files of the soil map in PDF, PMF, JPF, and shapefile can be found at (Santos & et al. , 2011).

## Population

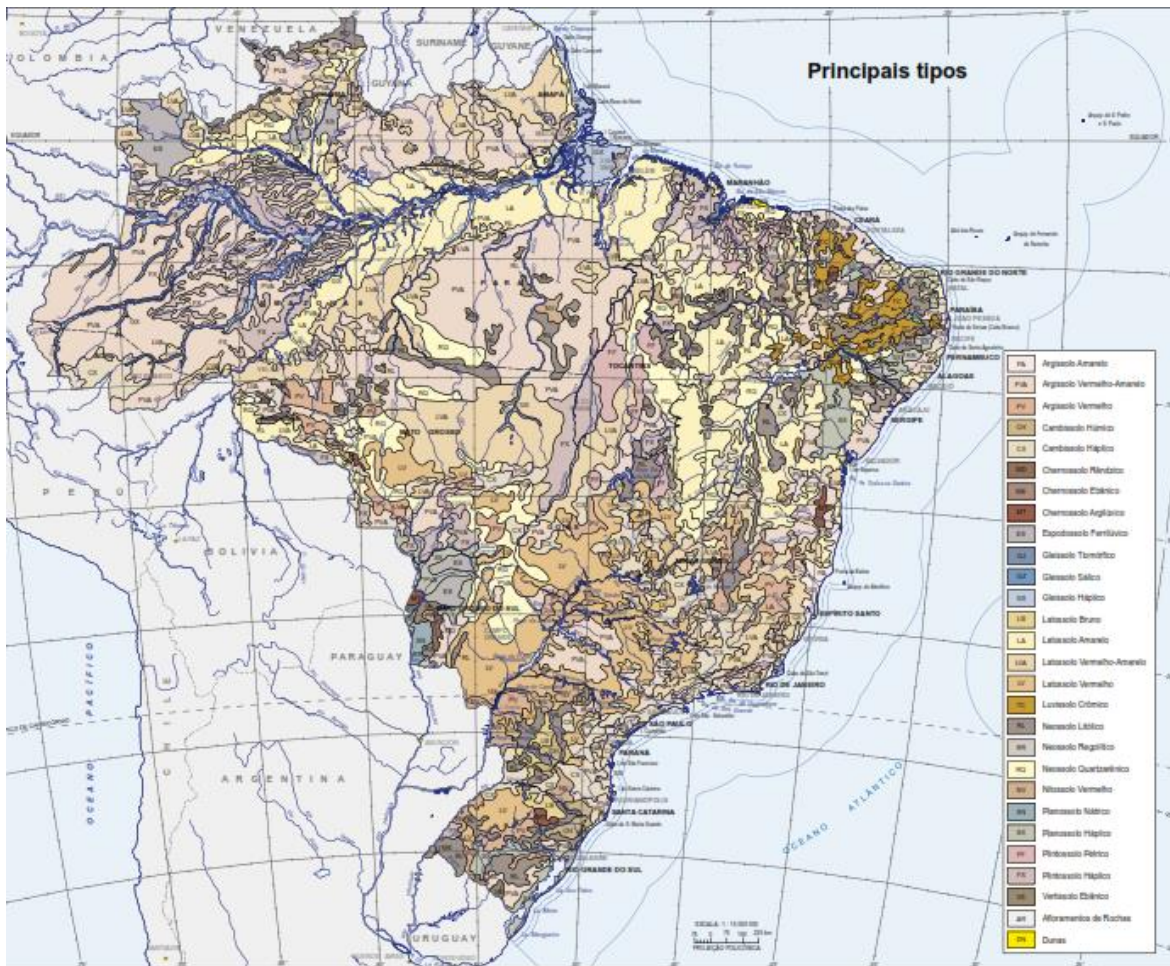
Brazil is the fifth most populous country in the world, after China, India, the USA and Indonesia.

The majority of Brazilians are of European or African descent. Apart from the original Portuguese settlers, others who have settled in Brazil and significantly influenced its culture include Germans (mainly in the southern states), Italians and Japanese (mainly in the state of São Paulo). There are many other smaller ethnic communities in the larger cities representing most nationalities. There are also some sparse indigenous tribes in the jungle regions.

Like most developing countries, Brazil has a young population, but the median age has been increasing since the mid-20th century. By the 1980s the proportion of people under 20 had declined to less than half of the total, and the trend continued into the early 21st century, when slightly fewer than one-third of Brazilians were recorded as age 15 and under. During that time the proportion of people in the older age groups increased, so that nearly one-fourth of the population was age 45 and over. See more details in Figure 1.



**Map 5 - Principal Soil Types of Brazil.**



Source: (IBGE, 2014k)

As Brazilian society has modernized and become more affluent, life expectancy has increased and the rate of population growth has declined. The birth rate has also generally declined but varies according to region. In 1960 the national average was just over 6 births per female of childbearing age, with a high of 8 to 8.5 in the most rural states and much lower rates in Rio de Janeiro. By the early 21st century the national average dropped to roughly 2 births per childbearing woman, partly because of the populace's gradual acceptance of family planning measures. Infant mortality rates are still a serious concern but vary widely according to region and socioeconomic status: in the affluent urban districts the rate is quite low, but in the favelas and other poor communities, particularly in the Northeast, it is much higher.

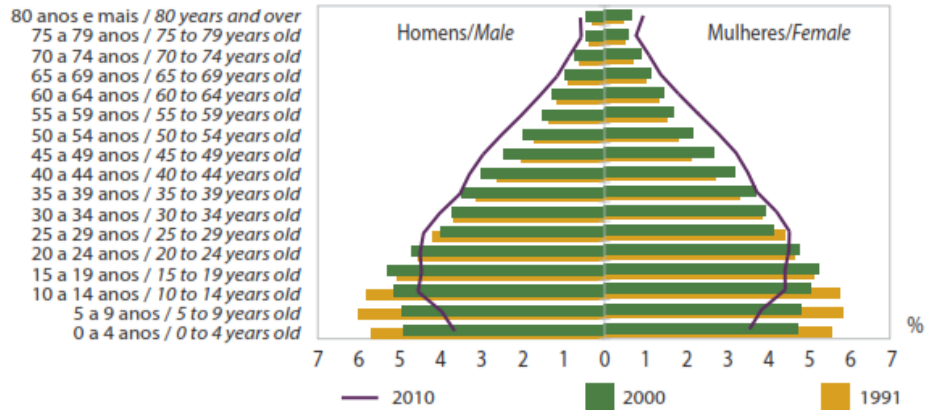


**Table 2 - Summary of Population Characteristics**

<b>Population</b>	202 million (projected for June 2014 (IBGE, 2014e))
<b>Urban population</b>	84,6% urban (2010)
<b>Sex Distribution</b>	48.97% male, 51.03% female (2010). See more details in Figure 1
<b>Most populated metropolitan regions</b>	São Paulo (19.9 million), Rio de Janeiro (11.9 million), Belo Horizonte (5.4 million), Porto Alegre (4.1 million), Salvador (3.9 million), Recife (3.8 million), Fortaleza (3.6 million), Brasilia (3.5 million), Curitiba (3.2 million) and Campinas (2.6 million) See the distribution of the population over the territory in Map 6
<b>Age Breakdown</b>	24.08% under 14, (2010) 68,54% 15 to 64, 7,38% 65 and over. See more details in Figure 1
<b>Life expectancy at birth, total</b>	74 years (in 2012)
<b>Total fertility rate</b>	1.67% (2012)
<b>Religion</b>	No State religion exists in Brazil; the Constitution guarantees freedom of belief and expression. Most of the population is Christian (64.6% Roman Catholic and 22.2% Protestant). 8% declare themselves to have no religion, while 2% are Spiritist.

Figure 1 shows the distribution of the population by age class. It can be seen that the bulk of population is made of young adults and that children and teenagers are not the dominant classes as in decades before.

Figure 1 - Population Distribution by Age Class



Source: ( PricewaterhouseCoopers, 2013)

Map 6 - Population Density in 2010



Source: (IBGE, 2014f)

## The Economy<sup>8</sup>

Brazil is one of the world giants of mining, agriculture, and manufacturing, and it has a strong and rapidly growing service sector. It is a leading producer of a host of minerals, including iron ore, tin, bauxite (the ore of aluminum), manganese, gold, quartz, and diamonds and other gems, and it exports vast quantities of steel, automobiles, electronics, and consumer goods. Brazil is the world's primary source of coffee, oranges, and cassava (manioc) and a major producer of sugar, soy, forest products, and beef; however, the relative importance of Brazilian agriculture has been declining since the mid-20th century when the country began to rapidly urbanize and exploit its mineral, industrial, and hydroelectric potential. The city of São Paulo, in particular, has become one of the world's major industrial and commercial centers.

Almost continuously high rates of inflation in the late 20th century affected every aspect of Brazil's economic life. Inflation came in part from the government's policies of deficit spending, heavily financing industrial expansion, and subsidizing business loans, as well as the practice among individual Brazilians of obtaining loans from foreign banks when domestic credit was restricted. In the latter part of the 20th century, Brazil indexed nearly all transactions for inflation, according to the constantly corrected value of the government's bonds. This practice virtually institutionalized inflation and led to public acceptance of its inevitability. As a result, Brazil's anti-inflation programs were only fleetingly successful until the mid-1990s, when the government initiated the Real Plan (*Plano Real*), a program that strictly limited government spending, introduced a new currency, and made other fiscal reforms.

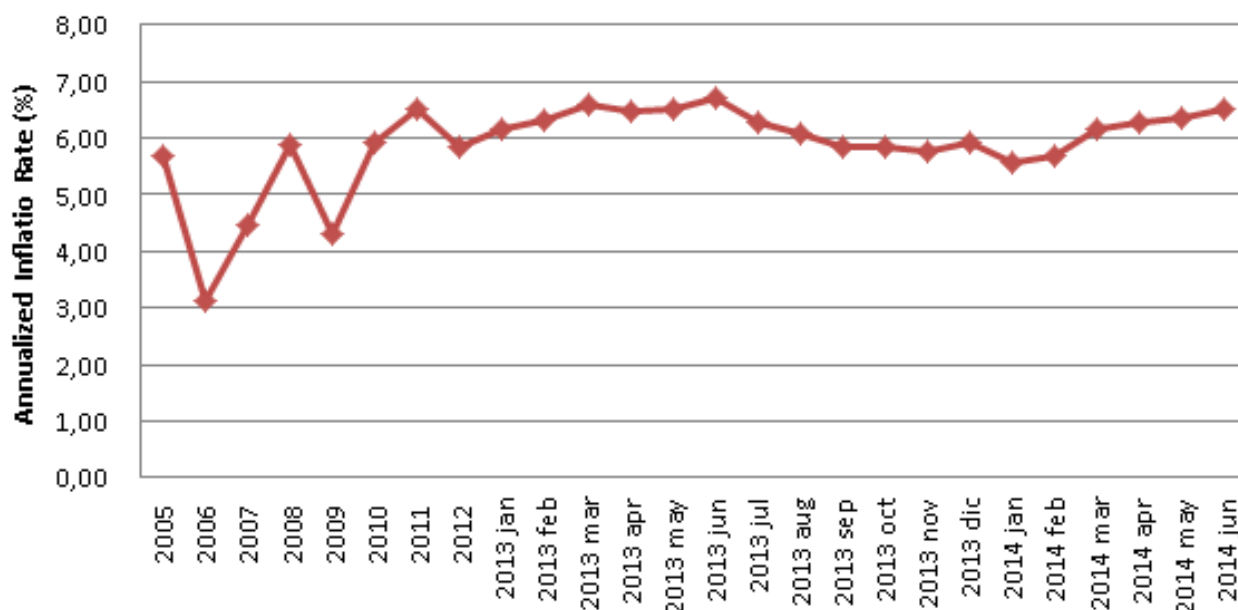
The government privatized dozens of financial institutions, manufacturers, and mining companies in the 1990s, including several major steel producers and the Rio Doce Valley Company (*Companhia Vale do Rio Dôce*; VALE). The VALE, Brazil's giant mining and shipping conglomerate, was apportioned into separate (but still economically formidable) mining and shipping units. The government also sold a minority of its Petrobrás shares to private investors and partially opened the petroleum industry to competition. Additional public offerings of Petrobrás shares followed—in 2010, notably, the company raised about \$70 billion in the world's largest share offering to date—but the government retained its majority ownership.

At the beginning of the 21st century, serious problems marked the Brazilian economy, aggravated by political uncertainties. Inflation, financial instability, and unemployment (or underemployment) remained constant threats, and political and financial scandals periodically erupted throughout the country. However, by mid-2004 the inflation rate had decreased, and for the first time Brazil issued bonds in its own currency, the real, instead of the dollar. Brazil still has one of the world's most lopsided distributions of wealth: 10 percent of the people received nearly half of the country's income, whereas the poorest 40 percent of the population brought in less than one-tenth of the

<sup>8</sup> This section offers an overview of the main features of Brazil economy. Annexes 2 through 6 provide summary tables with various economic and social indicators as seen by different authors for different purposes. Annex 3 presents complementary selected parts of the 2013 Investment Climate Statement for Brazil as seen by the US State department that complements the summary presented below.

total. In addition, patterns of landownership continued to be grossly uneven, as they were in colonial times, and social movements agitated for reforms. Figure 2 shows the recent resurgence of inflation.

**Figure 2 - Annualized Inflation Rate 2005-2012 and January 2013-June 2014**

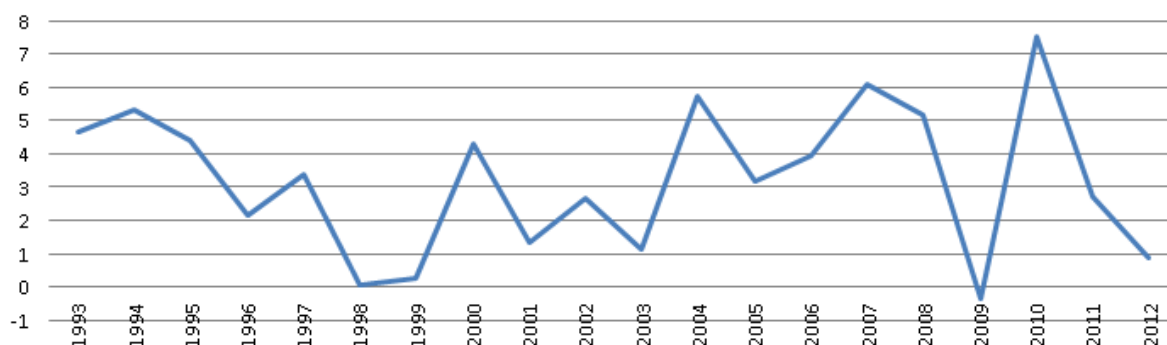


Source: prepared by the author with data from (Banco Central do Brasil, 2014)

The Brazilian investment grade has been increased to BBB with a stable outlook according to the evaluation of "Standard & Poor's" in the mid of the financial crisis in 2011.

The wealthiest areas of Brazil, in which industrialization and a modern regional economy have taken hold, are the Southeast and the South. In contrast, the Northeastern and Central Western regions are predominately agricultural and relatively poor because economic and social programs have not yet been modernized. The Northern region, dominated by the Amazon rain forest, has a low population density and remains virtually unexplored.



**Figure 3 - GDP Annual Growth Rate (%)**

Source: prepared by the author with data from (The World Bank, 2014a)

Brazil's domestic market, with over 201 million people, drives its economic growth. The fundamentals propelling Brazil's domestic market are strong: the middle class is expanding – it is expected to grow to 118 million by 2014 – consumer credit is becoming more accessible, inflation remains under control and purchasing power has increased as a result of wage growth and record low unemployment rates. Upward social mobility, shown by an increase in the emerging middle class, is creating a huge demand for consumer products. Brazil's demographic profile is a further positive characteristic, as the vast majority of the population falls within the economically active range. Historical trends of personal disposable income per capita are also a positive factor contributing to Brazil's attractiveness to the international market. According to Deloitte Touche Tohmatsu, Brazil's 10-year per capita disposable income growth in US dollars was 14% over the period 2001 to 2011, the second-highest growth rate for leading economies after China. (Government of Brazil, 2014)

## Resources

Brazil has some of the world's most abundant renewable and nonrenewable resources. Most of the country's proved mineral reserves, agriculturally productive land, and other sources of wealth have been exploited in the Southeast and South, the country's economic heartland; however, other regions have been growing in prominence. Improved transportation has made more of these resources accessible either for export or for use by Brazil's burgeoning industries and growing population.

Brazil is a leading global player in a broad range of economic sectors. In advanced manufacturing, Brazil is proud to host multinational original equipment manufacturers, as well as homegrown talent, in aerospace, automotive, capital goods, chemicals, construction, electronics, engineering, information and communications technologies, life sciences and oil and gas. Brazil is also home to world-class service industries, including construction, engineering and financial and professional business services.

Commodities continue to play an important role in Brazil's economic emergence and have done so ever since European settlers first arrived in Brazil, with the country's name likely deriving from a commodity – a lustrous red timber called brasilwood. Agricultural advances over the past twenty years have seen Brazil emerge as one of the most vitally important food producers in the world. Today, Brazil is among the top producers and exporters of a wide range of commodities, including biofuels (ethanol and biodiesel), iron ore, soybeans, coffee, oranges, poultry, beef, pork, aluminum and forest products.

Brazil contains extremely rich mineral reserves that are only partly exploited, including iron ore, tin, copper, pyrochlore (from which ferroniobium is derived), and bauxite. There are also significant amounts of granite, manganese, asbestos, gold, gemstones, quartz, tantalum, and kaolin (china clay). Most industrial minerals are concentrated in Minas Gerais and Pará, including iron ore, bauxite, and gold. Mato Grosso and Amapá have most of the known manganese ore deposits. The vast majority of kaolin is found in the Amazon basin. Low-quality coal reserves are located in Rio Grande do Sul and Santa Catarina. Brazil also has deposits of several other metallic and nonmetallic minerals, some of which are major exports. Brazil has huge offshore reserves of petroleum and natural gas, notably in the Southeast.

Recent oil and gas discoveries – the largest find in the last 30 years in the Americas – as well as abundant renewable energy resources, including hydro, wind and solar power, all contribute to increasing Brazil's status as a major international energy player, currently holding the 10 -largest oil reserves on the planet.

Brazil, with its extensive river systems and plentiful rainfall, has one of the largest hydroelectric potentials in the world. Most of its hydroelectric dams are concentrated in the Southeast and the South, the areas that consume the vast majority of power in Brazil; among the rivers harnessed in that area are the Iguaçu, Tietê, Paranapanema, Paranaíba, Grande, and upper reaches of the São Francisco. The Tocantins River (in the North) and the lower São Francisco (in the Northeast) are also dammed. Several other rivers hold enormous hydroelectric potential but are distant from major industrial and urban complexes.

## Agribusiness

Modern, efficient and competitive, Brazil has grown into one of the world's largest agricultural producers and exporters in the past two decades. Gains in productivity, management efficiency, research, innovation and technological development have revolutionized the country's agribusiness sector. Combined with the largest arable land area in the world – 388 million hectares (almost 960 million acres) of farmable, fertile land – and rising demand to feed a growing global population that is expected to reach 9 billion by 2050, the fundamentals driving demand for agribusiness in Brazil are strong.

Brazil's leadership in the agribusiness sector has been achieved as a result of favorable growing conditions and long-term investment in tropical farming technology research and development.



The climate is conducive to agricultural production, with much of Brazil receiving over 1,200 millimeters of rain each year and abundant sunlight. This allows for two crop cycles per year without the need for irrigation in some regions.

(Government of Brazil, 2014)

Agribusiness GDP represented 22.3% of Brazilian GDP in 2010, a total of R\$ 821 billion. Agribusiness is the main responsible for Brazilian trade balance surplus, representing 37% of total exports.

Vast areas of land are suitable or adaptable for agriculture. The country has made long-term investments in agricultural research and now has a very advanced tropical agricultural technology in the world. This has allowed agribusiness to develop and increase its production and exports. Brazil is currently the world's biggest producer of the following products: Coffee, sugar and orange juice. Brazil also has a very significant production of soybeans of 60 million tons, about 25% of global output. In terms of exports, Brazil is the main exporter of the following products: soybeans, coffee, sugar, orange juice, ethanol and beef. Other important crops include maize, cocoa, tobacco and bananas. Agribusiness performance has improved in the last five years, primarily driven by exports of soy and soy products, beef, pork and poultry.

The Brazilian cattle herd growing continuously and has made advances in productivity. The production cost of Brazilian beef is amongst the lowest in the world, which makes it extremely competitive. It is believed that Brazil will continue to be the leading global exporter of beef and poultry. Brazil occupies an outstanding position in the biofuels and bioelectricity sector, which has the capacity to make the global energy matrix greener and more renewable. The sector is stimulated by certain other significant competitive edges, like highly qualified human resources, the initiatives of private and public research institutes of international repute, and the agricultural credit supply at competitive interest rates. The country is now therefore capable of meeting the world's food demand, thanks to successive production and productivity records. It is also capable of meeting domestic demand and generating a growing surplus for export.

(Government of Brazil, 2014)

## Industry<sup>9</sup>

Whereas other Latin American countries export the vast majority of their mineral and petroleum production, Brazil's powerful manufacturing sector is a ready market for primary materials.

Mining and quarrying: Brazil's industries absorb most of its mineral production, including iron ore from Minas Gerais and Pará (though ore from the Carajás region is largely exported); chrome, magnesium, and quartz from Bahia; copper and lead from Bahia and Rio Grande do Sul; bauxite from Pará; asbestos from Goiás; manganese from Amapá, Mato Grosso do Sul, and Bahia; zinc and graphite from Minas Gerais; nickel from Goiás and Minas Gerais; and limestone from various

<sup>9</sup> Extracted from (Encyclopædia Britannica, 2014)

states. Brazil is self-sufficient in cassiterite (tin ore), found along a belt south of the Amazon. Mines in Rio Grande do Norte meet nearly all of the country's tungsten requirements, and Bahia and Paraná provide most of Brazil's silver. Coal production, which is centred in Santa Catarina, supplies more than half of the country's needs.

Brazil is a major gold and diamond producer, but quantities fluctuate widely from year to year and place to place as deposits are located and exhausted. Most gold and diamonds are mined in Minas Gerais, and smaller amounts are produced in Pará, particularly in the vicinity of Serra Pelada, where tens of thousands of *garimpeiros* swarmed during gold rushes in the 1980s and '90s. Minas Gerais, Bahia, and Espírito Santo are the major sources of Brazil's enormous range of gems—topazes, amethysts, opals, aquamarines, tourmalines, emeralds, and others—that make Brazil a world leader in precious and semiprecious stones.

**Petroleum and natural gas:** Brazil produces the majority of its petroleum and some natural gas, mainly from offshore fields along the continental shelf. Drilling was confined to the Northeast, in the Bahia basin just north of Salvador, from 1940 to the 1960s, after which the area of exploration expanded to include wells on the mainland and offshore from Fortaleza in the north to Santos (in São Paulo state) in the south. Brazil extracts more than two-thirds of its petroleum from the Campos basin on the continental shelf off Rio de Janeiro state. There Petrobrás has developed some of the most advanced deepwater drilling technology in the world, including a well more than 1.5 miles (2.4 km) below the surface. In the early 21st century Petrobrás confirmed that the Tupi offshore oil field, located about 4.3 miles (6.9 km) underwater, contained about five to eight million barrels of oil and natural gas, which boosted Brazil's supply of oil reserves substantially. Most of the country's natural gas comes from Bahia and Sergipe states, and there are petroleum and natural gas reserves throughout the Amazon basin, but oil refineries near Manaus have a limited capacity.

**Power:** Brazil's total power capacity has expanded rapidly since 1950, mainly through hydroelectricity, which now accounts for nine-tenths of the country's electric power. The government has given lower priority to thermal power generation because of the poor quality of Brazilian coal. The opening of a gas pipeline from Bolivia in 1999 has led to a program for construction of gas-fired thermoelectric generating plants, chiefly in the Southeast. The opening of a Bolivia-Brazil natural gas pipeline in 1999 has encouraged the construction of numerous gas-fired thermoelectric plants, chiefly in the Southeast.

Brazil's first nuclear reactor, Angra I, opened in 1982 near Rio de Janeiro. Brazil's second nuclear reactor, Angra II, began operating in 2000. In 1984 the Itaipú hydroelectric complex, the world's largest power station at its completion, began operating on the Alto Paraná River between Brazil and Paraguay. Dozens of smaller generating stations function on the Paraná and Uruguay rivers and their tributaries. Among other major complexes are Tucuruí, which began operating on the Tocantins River in the mid-1980s, and Sobradinho and the Paulo Afonso series of stations, all on the lower São Francisco River. Major hydroelectric projects for the Amazon region have been held in abeyance owing to ecological concerns.

**Manufacturing:** Manufacturing accounts for about one-fifth of the GDP and more than one-tenth of the labour force. With few exceptions, the Southeast contains the largest, most varied, and most efficient establishments in every sector of industry. It also employs three-fifths of the country's industrial workers, who earn most of Brazil's wages and produce the largest value of its goods. The South employs more than one-fifth of the country's industrial workers, but the Northeast employs roughly half that number, and at lower wages than in the Southeast and South. Within the Southern and Southeastern states, the manufacturing sectors of Paraná, Minas Gerais, Rio de Janeiro, Rio Grande do Sul, and Espírito Santo are increasingly offsetting the industrial strength of São Paulo, which alone produces nearly two-fifths of Brazil's manufactured goods. Generally speaking, Brazil's factories are not large; only a few employ a hundred or more workers. As might be expected, the largest firms are in the Southeast, followed by the South.

Since the mid-20th century Brazil has been a major world supplier of automobiles, producing nearly two million vehicles per year. Other major manufactures include electrical machinery, paints, soaps, medicines, chemicals, aircraft, steel, food products, and paper. Brazil has been a major producer of textiles, clothing, and footwear since the early 19th century. The textile industry began in Bahia in 1814, using local supplies of raw cotton; it is now centered in São Paulo and Fortaleza. The footwear industry, centered in Rio Grande do Sul, began in the 1820s with small leather works supplied by surplus hides from the meatpacking industry.

**Services:** The rapidly expanding service sector is Brazil's largest employer, accounting for more than half of the labor force. It is composed of private and government services, including national and local bureaucracies, public utilities, and a host of special agencies. In the private sector the largest number of workers is employed in hospitality industries (hotels, restaurants, and bars) and repair shops of various kinds. Retail sales and personal services each account for most of the rest of the private-sector workers. Employment is growing most rapidly in the field of information technology.

## Trade

Foreign trade has been critical to the Brazilian economy throughout the country's existence; however, exports historically accounted for only a small part of the national income, and Brazil had difficulty maintaining a favourable trade balance, partly because of its huge foreign debt payments. The situation began to change with several years of trade surpluses in the 1980s and '90s. By the beginning of the 21st century, as the country's foreign debt fell, exports flourished (spurred by government financing as well as efforts to negotiate increased access to foreign markets), and Brazil enjoyed a significant positive balance of trade. Another important contributor to the growth of exports was the country's expanding ethanol industry.

The United States is Brazil's principal trading partner. However, regional trade has been increasing, notably with Argentina, since the Southern Common Market ([Mercosur](#), or Mercosul) was established in 1991. Other major trading partners include Germany, Japan, Italy, France, China, and the United Kingdom. (Encyclopædia Britannica, 2014)

## Financial System

The Brazilian financial sector is large and sophisticated. Banks lend at Brazilian market rates which, while they have fallen since 2011, remains high. Reasons cited by industry observers include high taxation, repayment risk, concern over inconsistent judicial enforcement of contracts, high mandatory reserve requirements, and administrative overhead.

The financial sector is concentrated, with 2012 Central Bank data indicating that the 10 largest commercial banking institutions account for approximately 81 percent of financial sector assets, less brokerages (approx. US\$ 2 trillion). Three of the five largest banks (in assets) in the country, Banco do Brasil, Caixa Economica Federal, and BNDES, are partially or completely federally owned. Lending by the large banking institutions is focused on the largest companies, while small and medium banks primarily serve small and medium-sized companies, but with a much smaller capital base.

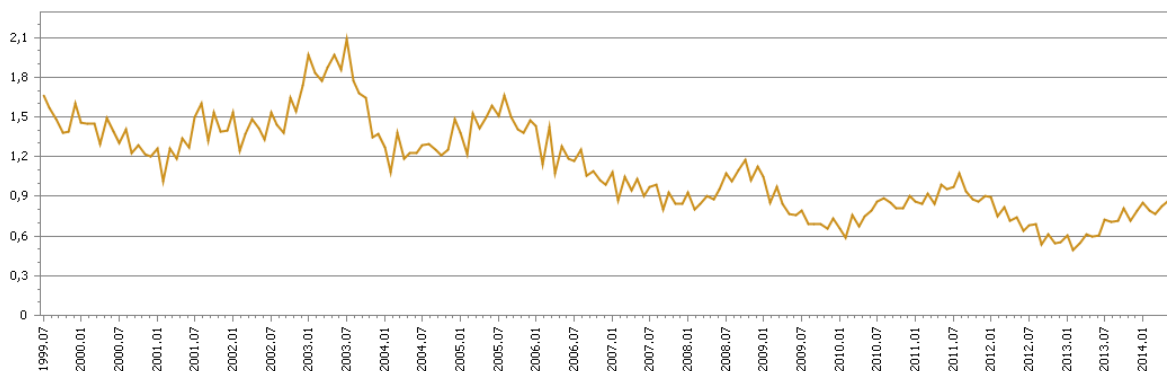
The Central Bank has strengthened bank audits, implemented more stringent internal control requirements, and tightened capital adequacy rules to better reflect risk. It also established loan classification and provisioning requirements. These measures are applied to private and publicly owned banks alike. The Brazilian Securities and Exchange Commission (CVM) independently regulate the stock exchanges, brokers, distributors, pension funds, mutual funds, and leasing companies with penalties against insider trading.

## Credit Market

Brazil's credit market has grown significantly over the past several years. Real interest rates, once among the highest in the world, fell dramatically in 2012, driven by continued decreases in the Central Bank's benchmark overnight SELIC lending rate and a concerted effort by the GOB to reduce lending spreads charged by public and private banks. While local private sector banks are beginning to offer longer credit terms, BNDES, the government national development bank, is the traditional Brazilian source of longer-term credit, and also provides export credits. FINAME (the Special Agency for Industrial Financing) provides foreign and domestically owned companies operating in Brazil financing for the manufacturing and marketing of capital goods. FINAMEX (Export Financing), which finances capital good exports for both foreign and domestic companies, is a part of FINAME. One of the goals of these financing options is to support the purchase of domestically produced over imported equipment and machinery. (Bureau of Economic, Energy and Business Affairs, 2014)



**Figure 4 - Central Bank's Benchmark Overnight SELIC Lending Rate (average % per month)**



Source: (IPEA, 2014)

In order to make this document easier to understand, the first topic is a summary of the structure and governance of Brazil's National Financial System (SFN). The SFN is comprised of financial institutions and oversight bodies that operate in different markets, in particular the capital, monetary, credit and exchange markets. The building blocks of the SFN as it stands today were created by Law 4,595/1964, also known as the bank reform law, and by Law 6,385/1976, which created the nation's capital markets. From the structural point of view, the oversight bodies and the institutions that operate under the umbrella of the SFN are guided by three normative agencies: the National Monetary Council (CMN), the National Private Insurance Council and the Supplemental Pensions Management Council. This document covers institutions, markets and transactions that are under the regulatory umbrella of the CMN and its subordinate oversight bodies.

The National monetary Council (CMN) is comprised of the Minister of the Finance, the Minister of Planning and the President of Brazil's Central Bank. It is the highest authority within the SFN, and responsible for formulating monetary and credit policies in general. The main SFN oversight bodies, the Brazilian Central Bank and the Securities and Exchange Commission, are both subordinate to the CMN.

The Brazilian Central Bank (BCB) is responsible for enforcing monetary policy, for managing international reserves and overseeing foreign capital and credit. The BCB enforces prudential regulations and also acts as a monetary authority.

As a prudential regulator, the BCB is responsible for ensuring systemic stability as the "lender of last resort" to financial institutions, and the administrator of the payments system.

The Securities and Exchange Commission (CVM) is responsible for regulating and overseeing the capital markets, including securities issuers, exchanges and OTC markets, and the institutions that

are part of the system to distribute securities. The CVM aims to keep the market efficient and foster development, and also strives to protect investors and maintain equitable practices in the securities market, enforcing the rules regarding information disclosure and transparency.

From an operational point of view the financial system is made up of a large set of financial institutions - banking and non-banking, that act directly in the capital, monetary, credit and exchange markets, as well as all of the support entities such as the stock exchanges, the environments where transactions are registered and recorded, the clearinghouses and the CSDs, among others. The following chart shows the main components of this structure.

(BM&FBOVESPA, na)

For almost 20 years, Brazil's financial system has been prudently managed by an autonomous Central Bank whose primary mandate is price stability through an inflation-targeting regime, fiscal responsibility in government expenditures and regulations and a free-floating currency. Commitment to this “tripod” of macroeconomic stability is firm. Today, Brazil is strengthened by a record-low net public debt-to-GDP rate of 35% and record-high international reserves of over \$380 billion. A strong symbol of how Brazil has evolved in terms of financial stability over the past decade came in 2009, when Brazil became a net creditor of the International Monetary Fund (IMF) at a time when a number of Eurozone economies were applying to the IMF for stabilization loans. Despite the onset of the global credit crunch and ensuing global recession in 2008/09, total credit volume in the Brazilian financial system expanded by 39.8% over the period between September 2008 and September 2010. Real interest rates have been brought down from 13% on average from 1995 through 2008, to less than 2% on average in 2012 and 2013. Public banks in particular have played a key role in credit growth.

As a member of the G20, Brazil is committed to coordinate with advanced economies and peer emerging markets to help bring stability to global financial architecture. In this regard, Brazil has begun early implementation of new rules for capital requirements in banks to provide even greater strength to Brazil's financial system

Additionally, public banks such as the BNDES (Brazilian Development Bank), Caixa Econômica Federal and Banco do Brasil have been capitalized in order to strengthen their lending capabilities thus boosting consumption and investments. In a context of low economic growth, the result in terms of public finance was a major drop in revenue, which, together with the increased spending, kept the government from fulfilling the primary surplus target (3.1 percent of GDP). In spite of that, though, it is important to note that Brazil's solvency risk is still low. (PricewaterhouseCoopers, 2013)

BM&FBOVESPA is the world's third-largest exchange and the second-largest in the Americas by market value. It has 80% of the total volume traded in Latin American stock exchange markets. BM&FBOVESPA is the only futures exchange in Brazil and largest in Latin America based on the number of futures contracts traded. BM&FBOVESPA develops and manages systems for the trading and settlement of derivatives products, equities and securities. Under Brazil's financial system, there are four main institutions:





## Taxation <sup>10</sup>

Taxes in Brazil are relatively high and compliance costly and cumbersome. However, tax subsidies and incentives are frequently available and credit funding is often subsidized mitigating in part the effects of higher taxes.

In the 2014 World Bank ‘Doing Business’ report, Brazil ranked 116th out of 189 countries in terms of overall ease of doing business, an improvement of two places versus the 2013 report. Korea ranks 7<sup>th</sup>. According to the study, it takes an average of 13 procedures and 107.5 days to start a new business, significantly longer than the OECD high-income economies’ average of 11.8 days while in Korea it takes 5.5 days. The study noted that the annual administrative burden to a medium-size business of tax payments in Brazil is an average of 2,600 hours versus 175 hours in the OECD high-income economies and 187 hours in Korea. Total tax rate was estimated at 68.3% of profit which compares to 41.3% to OECD’s countries and 27.9% in Korea. Business managers often complain of not understanding tax regulations, despite best efforts including large tax and accounting departments. (The World Bank, 2014b) (The World Bank, 2014c)

Table 3 shows the rankings for comparator economies and the regional average ranking so as to provide other useful information for assessing the tax compliance burden for businesses in Brazil.

**Table 3- Summary of Tax Rates and Administrative Burdn in Brazil**

Indicator	Brazil	Latin America & Caribbean average	OECD high income average
Payments (number per year)	9	30	12
Time (hours per year)	2,600	369	175
Profit tax (%)	24.9	20.5	16.1
Labor tax and contributions (%)	39.6	14.7	23.1
Other taxes (%)	3.8	12.1	2.0
Total tax rate (% profit)	68.3	47.3	41.3

Note: In cases where an economy’s regional classification is “OECD high income,” regional averages above are only displayed once.

(The World Bank, 2014b)

Tax regulations, while burdensome and numerous, do not differentiate between foreign and domestic firms. However, there have been instances of complaints that the value-added tax collected by individual states (ICMS) favors local companies. Although the tax is designed to be refunded upon export of goods outside of the country, exporters in many states have had difficulty receiving their ICMS rebates. Taxes on commercial and financial transactions are particularly

<sup>10</sup> Based heavily on (Government of Brazil, 2014)

burdensome, and businesses complain that these taxes hinder the international competitiveness of Brazilian-made products.

The Brazilian Federal Constitution of 1988 gives the main guidelines for taxation. It establishes the general principles of taxation, limitations on the power to tax, jurisdiction to tax amount levels of government and tax revenue sharing provisions.

Administrative-political autonomy confers on each level of government the possibility of instituting taxes, fees (due to its police power or to the use of public services) and improvement charges (due to public works). Most social contribution taxes can only be established by the federal government.

There are also regulatory taxes, like the IOF (Tax on Financial Transactions), the IPI (Excise tax) and the CIDE (Contribution for Intervention in the Economic Domain), which are used by the Federal Government as auxiliary instruments in conducting monetary and industrial policies, respectively.

### **Corporate Taxes**

No foreign corporation may carry out permanent activities in Brazil except through a registered subsidiary, branch or permanent establishment, and these corporate entities, including those that are foreign controlled, must calculate and pay tax on a monthly basis and file an annual tax return consolidating the monthly results from the previous calendar year. This annual return has to be filed by the end of June.

For tax purposes, business profits are computed on the basis of net income, as reported in the income statement (profit and loss account), adjusted for non-taxable income and non-deductible expenses.

Inter-company transactions are subject to transfer pricing rules.

Capital gains are taxed as ordinary income. The cash basis may be used to compute profits on certain long-term sales of permanent assets. Capital losses may only be offset by capital gains. Unused capital losses are treated similarly to income tax losses with regard to limits on use and carry forward period.

Gains from the sale of depreciable property are treated as ordinary non-operating income and not as capital gains.

Corporate taxpayers may elect to include exchange gains and losses in their taxable income, on an accrual basis or when realized.

Interest income is taxable on the accrual basis.

There is no legislation that favors foreign shareholders or holding companies. Companies participating in certain sectors, such as banking, insurance, leasing, etc., are subject to special tax rules.

**Figure 5 - Main Taxes and Contributions in Brazil**

SERVICES	PRODUCTS	SERVICES AND PRODUCTS
<b>ISS</b> – Service Tax - 2% and 5% (depending on the type of service).	<b>ICMS</b> – Value-added Tax on Sales and Services - Intra-State and Interstate: 7% and 12%, respectively. Imports: 4% (the final manufactured product must feature more than 40% imported parts/components).	<b>IRPJ</b> – Corporate Income Tax – At a rate of 15%, plus a 10% additional rate on monthly income that exceeds BRL 24,000.
<b>INSS</b> – Social Security Contribution - 11%.	<b>IPI</b> – Excise Tax – Ranging from 0% to 330% (depending on how essential the product is and in conformity with the IPI Tax Rates Table - TIPI <sup>10</sup> ).	<b>PIS</b> – Social Contribution on Gross Revenue – Presumptive Profit – Cumulative Regime: 0.65% Taxable Profit – Non-Cumulative Regime: 1.65%.
	<b>II</b> – Customs Duties - * Foreign Merchandise – Indicated in the Common External Tariff (TEC), usually ranging from 0% to 35%. * Baggage – 50%	<b>Cofins</b> – Social Contribution Tax Presumptive Profit – Cumulative Regime: 3% Taxable Profit – Non-Cumulative Regime: 7.6%.
	<b>IE</b> – Export Tax – 30% but it may be raised or lowered to meet the objectives of Brazil's exchange rate and foreign trade policies. The maximum rate may be raised up to 150%.	<b>CSLL</b> – Social Contribution Tax on Profit - 9%. Financial Institutions: 15%.
	<b>IOF</b> – Tax on Financial Transactions - Ranging from 0% to 25% (depending on the transaction <sup>11</sup> ).	
PAYROLL	PROPERTY	
<b>FGTS</b> – Employee Severance Indemnity Fund Contribution – 8%.	<b>IPTU</b> – <b>Property Tax</b> - There is no minimum or maximum rate established in federal law (it is therefore established by each municipality). Escalation criteria: location, value, use and social function.	
<b>INSS</b> – Social Security Contribution – 20%.	<b>ITR</b> – <b>Rural Property Tax</b> - Ranging from 0.03% to 20% (depending on land area and degree of land use).	
<b>SAT/RAT</b> – Occupational Environmental Risks – 1% and 3%.	<b>ITBI</b> – <b>Tax on Sale or Transfer of Properties</b> - There is no minimum or maximum rate established in federal law (it is therefore established by each municipality). Single rate, non-progressive regime.	
<b>Contribuição de Terceiros</b> – Third Party Contribution Taxes – SESI/SESC Social Programs, SENAI/SENAC Training Programmes, SEBRAE Program for Small Companies and INCRA Supplementary rural pension – 3.1%.		

Source: (Government of Brazil, 2014)

Tax holidays are offered to certain industries operating in specific areas.

No tax consequences arise from converting a non-incorporated business into an incorporated entity or from changing the corporate form, such as from a “limitada” (private limited liability company) into a corporation.

The current maximum consolidated effective tax rate on taxable income (IRPJ) is 34%. In addition to corporate income tax, all legal entities are subject to a social contribution tax to the federal government at the rate of 9% (except for insurance and financial institutions, which are subject to a 15% rate), which is not deductible for corporate income tax purposes. The tax basis is profit before income tax, after certain adjustments.

### **Foreign personnel**

In Brazil, foreign workers are taxed as residents on their worldwide income, regardless of the visa type. There are no special rules for foreign personnel who hold a permanent visa.

### **Partnerships and Joint Ventures**

The procedures for the taxation of partnerships and joint ventures are similar to those for corporate taxpayers.

### **Performance Requirements and Incentives**

Detailed explanation and regulations related to the federal government instruments to support productive investments can be found in (MDIC, 2012). Here only a brief explanation will be provided to illustrate the nature of such incentives.

The Brazilian government uses a variety of tax incentives and attractive financing through the National Bank for Economic and Social Development (BNDES) to actively encourage both domestic and foreign investment. In 2012, BNDES disbursements rose 12 percent to reach R\$156 billion, making it the largest development bank in the world, outpacing the lending of even the World Bank. BNDES funding in 2012 was focused on industry and infrastructure, with R\$18.9 billion for the electricity sector, R\$15.5 billion for transportation, and R\$8.5 billion for chemicals and petrochemicals. BNDES also actively promotes development in traditionally underserved populations and regions of the country and in other potentially less profitable ventures, but the majority of lending takes place in the more industrialized regions of the country. A 2004 Public-Private Partnership (PPP) investment law promotes joint ventures in otherwise marginally profitable infrastructure investments.

The Government of Brazil extends tax benefits for investment in less developed parts of the country, for example the Northeast and the Amazon regions, with equal application to foreign and domestic investors. These incentives have been successful in attracting major foreign plants to areas like the Manaus Free Trade Zone, but most foreign investment remains concentrated in the more industrialized southern part of Brazil.



Individual states have sought to attract investment by offering ad hoc tax benefits and infrastructure support to specific companies, negotiated on a case by case basis. These benefits have spurred a so-called “fiscal war” between the states, with some states challenging the tax benefits as harmful fiscal competition. In June 2011, the Brazilian Supreme Court ruled that the benefits granted by 14 states on interstate commerce are unconstitutional, as they were implemented without unanimous consent from the National Council of Fiscal Policy (Confaz). In November 2012, the Ministry of Finance proposed to Congress an end to the “fiscal war” by setting the interstate tax rate on goods at 4 percent for all states, thus limiting states’ ability to offer special tax incentives to attract investment away from other states. A decision on this proposal by Congress is expected in early 2013, but previous attempts at interstate tax reform have failed to gain Congressional support.

In October 2012, the GOB announced Decree 7819 in support of domestic auto manufacturers. The decree raised the Industrial Products Tax (IPI) by 30 percentage points of the price of the vehicle on all vehicle sales in the Brazilian market on or after January 1, 2013. This change affected all vehicles: domestically-produced, imports from other Mercosur member countries, imports from Mexico within quota, and all other foreign imports. Auto manufacturers are able to apply for a tax credit based on their ability to meet certain criteria, including the number of manufacturing processes performed in Brazil, enhancing fuel efficiency, committing to research and development investment in Brazil or Brazilian engineering services, and agreeing to participate in a fuel-efficiency labeling scheme. This decree is the successor to the September 2011 decree (No. 7567) which called for a 30 percentage point increase in the IPI on any car not sourced with at least 65 percent of parts from Merciful countries or Mexico, with which Brazil has an auto sector trade agreement. Decree 7567 expired on December 31, 2012. Both decrees are clear moves to encourage manufacturers to produce in Brazil rather than exporting cars to Brazil.

To promote Brazilian industry, the Special Agency for Industrial Financing (FINAME) of BNDES provides financing for Brazilian firms to purchase Brazilian-made machinery and equipment and capital goods with a high level of domestic content. The interest rates charged by BNDES are often significantly lower than the prevailing market interest rates for domestic financing.

In December 2011, the Government of Brazil passed Law 12546, which introduced the Special Regime for the Reinstatement of Taxes for Exporters, dubbed the Reintegra Program. Exporters of products covering 8,630 tariff codes – representing R\$80 billion of exports – will receive a subsidy of 3 percent of the value of their exports, to be used either as a credit against their income tax or as a cash payment. To qualify, the imported content of the exported goods must not exceed 40%, except in the case of high-tech goods, such as pharmaceuticals, electronics, and aircraft and parts, which are permitted to have up to 65% of inputs imported. In addition, Reintegra exempts exporters from so-called indirect taxes on capital expenditures, including the PIS/Cofins social contribution taxes and the IOF tax on financial transactions. The Reintegra Program, originally scheduled to expire at the end of 2012, was extended by the Ministry of Finance until December 31, 2013. (Bureau of Economic, Energy and Business Affairs, 2014)

**Korea treatment for investment and taxes** (PricewaterhouseCoopers, 2010)



Tax treaty: Payments are subject to withholding income tax at the rates of 15% or 10% for dividends or interest, and rates of 25%, 15%, or 10% on royalties.

Bilateral Investment Agreements: In the 1990's Brazil signed BITs with several countries, including the Republic of Korea, but none of these have been approved by the Brazilian Congress.

## Labor<sup>11</sup>

The Brazilian Ministry of Finance estimates that 19.3 million jobs were created in Brazil from January 2003 to October 2012. In 2012, a net 1.3 million jobs were created, compared to 1.9 million in 2011.

According to a 2011 Brazilian Institute of Geography and Statistics (IBGE) report, the Brazilian labor force is 92.5 million workers strong. Roughly 58% were located in the services sector, 15% in agriculture, 21% in the construction and manufacturing.

Brazil has signed on to a large number of International Labor Organization (ILO) conventions. Brazil is party to the U.N. Convention on the Rights of the Child and major ILO conventions concerning the prohibition of child labor, forced labor and discrimination.

The labor code is highly detailed and relatively generous to workers. Formal sector workers are guaranteed 30 days of annual leave and severance pay in the case of dismissal without cause. Brazilian employers are required to pay a “thirteenth month” of salary to employees at the end of the year. Brazil also has a system of labor courts that are charged with resolving routine cases involving unfair dismissal, working conditions, salary disputes, and other grievances. Labor courts have the power to impose an agreement on employers and unions if negotiations break down and either side appeals to the court system. As a result, labor courts routinely are called upon to determine wages and working conditions in industries across the country. The system is tantamount to compulsory arbitration and does not encourage collective bargaining. In recent years, however, both labor and management have become more flexible and collective bargaining has assumed greater relevance.

The Ministry of Labor estimates that there are nearly 15,000 labor unions in Brazil, but Ministry officials note that these figures are inexact. Labor unions, especially in sectors such as metalworking and banking, tend to be well-organized and aggressive in advocating for wages and working conditions and account for approximately 19 percent of the official workforce according to a recent IBGE release. Strikes occur periodically, particularly among public sector unions. Unions in various sectors engage in industry-wide collective bargaining negotiations mandated by federal regulation. While some labor organizations and their leadership operate independently of

<sup>11</sup> Based heavily on (Bureau of Economic, Energy and Business Affairs, 2014)



the government and of political parties, others are viewed as closely associated with political parties.

In firms employing three or more persons, Brazilian nationals must constitute at least two-thirds of all employees and receive at least two-thirds of total payroll. Foreign specialists in fields where Brazilians are unavailable are not counted in calculating the one-third permitted for non-Brazilians.

The IBGE statistical agency estimated unemployment in the major metropolitan areas as of December 2012 at 4.6 percent. With low unemployment, there is currently a shortage of highly-skilled workers. Unemployment levels range significantly across regions.

IBGE reports show that real wages have trended higher in recent years. The average monthly wage in Brazil's six largest cities was around R\$1,787.70 in October 2012 (approximately USD 880 based on average exchange rates for that month). The minimum monthly wage has regularly been increased in recent years from R\$380 in 2007 to R\$671 (approximately USD 335) in 2013. Earnings vary significantly by region and industry, and there is significant, though gradually declining, income inequality between Brazil's poor and wealthy.

Employer federations, supported by mandatory fees based on payroll, play a significant role in both public policy and labor relations. Each state has its own federation, which reports to the National Confederation of Industries (CNI), headquartered in Brasilia.

## Transportation<sup>12</sup>

Developing an efficient means of transportation has been a matter of critical importance for a country as large as Brazil. Throughout much of its history the country's coastal regions were connected via shipping and a few short roads, whereas the interior remained an isolated frontier. Railroads were built in the 19th century to link Brazil's mineral-producing regions to ocean ports; however, they facilitated only limited settlement of the interior, unlike in other Latin American countries, and the rail network could not be integrated quickly because different rail companies used incompatible gauges. Brazil's transportation infrastructure changed dramatically after World War II, first with the growth of air transport and, subsequently, with the extension of a modern road network. By the 1970s Brazil had the world's third largest commercial air fleet, and its roads were developing rapidly. In the 1990s the country's road system was the third-longest in the world (after the United States and India), and Brazil was among the top 10 countries in automobile registrations.

Since the inclusion of government-controlled railroads in the Brazilian National Privatization Program, there has been significant investment in the development and modernization of the railroad network. This network is mainly located in the Southeast and South regions, although there are plans for some major extensions in the North and Central-West regions. Urgent

<sup>12</sup> Extracted from (Encyclopædia Britannica, 2014)

investment has been earmarked for the Northeast region. However, road transport still dominates for both long distance and intercity traffic.

Most major federal and state highways are also in a poor state of repair. Nearly all road transport and haulage companies are privately owned. In addition, the government intends to privatize the remaining roads which have not been privatized yet. The air transport infrastructure is well developed and the majority of airline company voting stock is in private hands. Urban transport continues to present significant problems in major centres. Limited subway systems are now functioning in Rio de Janeiro and São Paulo, mainly in the latter, which has expanded its network. However, until a more extensive network has been developed, subways will not significantly alleviate the problems affecting urban transport. Many companies provide private bus services for their employees. The potential of the waterways and coastal transport has not been exploited.

A transportation infrastructure map at 1:6 000 000 scale can be found at (IBGE, 2014i) while road maps for the States of Minas Gerais and São Paulo can be found in Annex 1.

## **Roads**

Roads account for the vast majority of passenger traffic and roughly two-thirds of freight tonnage hauled. The country had few good paved roads at the time Brasília was constructed in the late 1950s. A four-lane highway linked Rio de Janeiro and São Paulo, but there were no paved roads from those cities to Pôrto Alegre, Curitiba, the Northeast, or west of Belo Horizonte. During the rainy season some roads could be flooded or blocked for a week or more at a time, stranding motorists in areas with limited housing and food supplies.

The construction of Brasília, for which many bulky materials had to be airlifted in during the rainy season, alerted the country to the poor state of its roads, and when the military assumed power in 1964 it made the upgrading of the road system a primary objective. As a result, a comprehensive system of paved highways now connects all of the major points in Brazil, including several cities in the Amazon region; paved roads account for about one-tenth of the Brazilian road system. Among the more prominent arteries are the Trans-Amazonian Highway and the Trans-Brasília project. Given Brazil's vast extent, these and other highways are extremely long and difficult to maintain, especially in the Amazon region.

## **Railways**

Railroads are of little importance to Brazil's transportation network except for certain bulk ore carriers and the commuter lines to the suburbs of Rio de Janeiro, São Paulo, and Brasília. In contrast to Brazil's dynamic highway construction program, few new railways of any significance have been built in the country since World War II, when Rio de Janeiro was linked by rail to Salvador because of attacks by German submarines on coastal shipping. The modest construction since that time has included a branch line from Minas Gerais to Brasília, the ore-carrying line (opened in 1985) between the Carajás mining project and Pôrto do Itaqui (near São Luis), and the Ferronorte line, which carries bulk agricultural products between Alto Taquari and the Alto Paraná





River in the Central-West. Brasília's metropolitan rail system, linking the capital with its suburbs, inaugurated its first section in 1994 and expanded rapidly thereafter. The federal government sold off its controlling shares of railways in 1997, but many states and cities retain control of local lines.

## Shipping

Brazilian coastal shipping was, for many years, in no better condition than its railways. After the federal government launched a shipbuilding program in the 1960s, however, cargo tonnage increased markedly, and, more significantly, ships began to carry a larger percentage of high-value goods as the frequency and reliability of services improved. Three-fourths of Brazil's ships are involved in coastal trade, with the largest proportion of oceangoing vessels owned by Petrobrás.

Brazil has also upgraded its specialized bulk terminals, including one on Sepetiba Bay, west of Rio de Janeiro, and the Itaqui ore terminal, just south of São Luís, as well as the iron-ore terminal at Tubarão, near Vitória, and the oil terminal at São Sebastião, on the São Paulo coast. Traffic through São Sebastião accounts for about half of the export value of São Paulo state, and much of the rest is handled through the port of Santos, which is the country's busiest port. Other significant ports include Rio de Janeiro, Paranaguá, Salvador, and Recife. Brazil's major port facilities, historically known for their high costs and low efficiency, were significantly improved in the late 1990s, mainly through privatization.

The extensive Brazilian river system has a total navigability of some 31,000 miles (50,000 km). Navigable waterways are the principal means of transportation in the North, where the principal ports are Belém, at the mouth of the Pará River (an effluent of the Tocantins), and the Amazon port of Manaus, some 1,000 miles (1,600 km) inland. Smaller boats ply the Amazon River system as far west as Pôrto Velho, on the Madeira River in Rondônia state, and the Peruvian port of Iquitos. The Paraguay-Paraná-Plata river system is little suited for long-distance navigation, although certain stretches were used for local transport in the early days of settlement. Barge traffic is increasing, however, and shallow-draft vessels can use the system to access the Atlantic through the Río de la Plata estuary. In the late 1990s the government began to improve navigation on the Tocantins, Araguaia, and Tietê rivers.

The São Francisco River is navigable in two separate sections: for 1,000 miles (1,600 km) northward from Pirapora to the hydroelectric dam at Petrolina and Juazeiro, and for about 170 miles (270 km) eastward from the Paulo Afonso Falls to the sea. Few of the shorter rivers flowing to the Atlantic are navigable; only the Paranaíba in the far north and the Jacuí in Rio Grande do Sul carry significant shallow-draft and barge traffic.

## Air

Brazilians were among the pioneers in flying, and they have long claimed that their countryman Alberto Santos-Dumont, not the Wright brothers, flew the first successful airplane. Numerous airlines flourished in Brazil at one time or another, but they have been consolidated into three major companies that compete nationwide: VARIG, which since the late 1920s has been a largely



employee-owned airline; the now privately owned São Paulo State Airline (VASP), which handles mainly domestic flights; and Transbrasil.

Every capital and major city in Brazil has an airport, and some 1,500 smaller cities and towns have airstrips. São Paulo, Rio de Janeiro, Belo Horizonte, and Brasília are all linked by air shuttle services, although the overall frequency of flights and the size of terminals are much smaller than those of comparable centres in western Europe and North America. This is due to the relatively high cost of air fares and competition from inexpensive intercity bus services. Rio de Janeiro and São Paulo, which each have two international airports, handle most international air traffic.

### **Business climate for Foreign Direct Investments<sup>13</sup>**

Successful agriculture and forest businesses depend on natural resources, productive human resources, competitively priced capital and inputs, and other favorable climate conditions for investments. Without such conditions, investments become too costly and risky while benefits too small and uncertain so that profits are not sufficient to motivate entrepreneurs and investors to act.

Even if a country counts with abundant natural resources such as soil, topography, and climate, which are the only resources that cannot easily be created or hired anywhere, it may not offer other needed conditions to investors. Agriculture and forest based businesses, therefore, cannot prosper and cannot generate the benefits to society that they otherwise could.

This section of the study discusses the performance of Brazil in various indexes measured by different organizations that seek to compare the conditions that entrepreneurs face in different countries to invest successfully. These indexes show the challenges businesses in Brazil have to face to succeed and prosper.

The success of business initiatives depends on several factors, many of which are internal to the firms while others are external. Those internal conditions are usually under the control of managers and success or failure of their operations depends on their capabilities and decisions. Managers also have to operate within an external environment which may favor or hinder their chances of success.

Table 4 summarizes the performance of Brazil in selected indexes created to compare several countries in terms of indicators that affect businesses. These indexes show not only the scores that try to quantify the performance of a country. It also ranks these scores to show the relative performance of a country in relation to its peers. In a world where countries have to increasingly compete with each other, the ranking of countries and how these relative performances vary in time, become critical for investors' decision making. Countries have not only to perform well in a given year, they also need to improve over time the conditions they offer more than other

<sup>13</sup> Prepared based on (Nascimento, 2011)

countries with which they compete for investments. This healthy competition leads to a positive feedback cycle that should benefit investors and society as a whole.

**Table 4 - Brazil's Performance in Selected Business Related Indexes**

Index Name	Brazil's score and rank.	Brief description
<b>Ease of Doing Business Ranking</b>	<b>Rank: 116 out of 189.</b>	The Ease of Doing Business Ranking is reported yearly by The World Bank, a financial assistant to developing countries. The Doing Business Ranking provides measures of business regulations and their enforcement across countries by measuring specific regulatory obstacles to doing business, such as protection of investors, protection of property rights, employment issues, and contract enforcement capabilities. The highest ranked country has the most favorable environment for conducting business in the world. Data collected in 2014. Source: (The World Bank, 2014b)
<b>Global Competitiveness Report</b>	<b>Score: 4.33 out of 7 Rank: 56 out of 148</b>	The Global Competitiveness Report is compiled yearly by the World Economic Forum, an independent international organization based in Geneva, Switzerland. The rankings provide a description of the economic competitiveness based on twelve pillars of competitiveness for countries at all stages of development. Some of the factors included come from publicly available data, but the majority comes from a survey the World Economic Forum sends to over 11,000 business executives worldwide. The highest ranked countries are the most competitive. Data collected in 2013. Source: (World Economic Forum, 2013)
<b>Human Development Index</b>	<b>Score: 0.730 out of 1 Rank: 85 out of 186.</b>	The Human Development Index (HDI) which looks beyond GDP to a broader definition of well-being. The HDI provides a composite measure of three dimensions of human development: living a long and healthy life (measured by life expectancy), being educated (measured by adult literacy and enrolment at the primary, secondary and tertiary level) and having a decent standard of living (measured by purchasing power parity, PPP, income). The index is not in any sense a comprehensive measure of human development. It does not, for example, include important indicators such as gender or income inequality and more difficult to measure indicators like respect for human rights and political freedoms. What it does provide is a broadened prism for viewing human progress and the complex relationship between income and well-being. Data: 2014. Source: (UNDP, 2014)
<b>Index of Economic Freedom</b>	<b>Score: 56.9 out of 100. Rank: 114 out of 178.</b>	The Index of Economic Freedom is reported annually by the Heritage Foundation, a research and educational institute. The Index of Economic Freedom analyzes a wide range of issues including trade barriers, corruption, government expenditures, property rights, and tax rates to generate an overall ranking of economic freedom. The highest ranked country is the country with the least number of restrictions and constraints on businesses. Data collected in 2014. Source: (Heritage Foundation, 2014)
<b>Economic Freedom of the World</b>	<b>Score: 6.51 out of 10.0 Rank: 102 out of 152</b>	The index published in Economic Freedom of the World measures the degree to which the policies and institutions of countries are supportive of economic freedom. The cornerstones of economic freedom are personal choice, voluntary exchange, freedom to compete, and security of privately owned property. Forty-two variables are used to construct a summary index and to measure the degree of economic freedom in five broad areas: (1) size of government; (2) legal structure and security of property rights; (3) access to sound money; (4) freedom to trade internationally; and (5) regulation of credit, labor and business. Data collected in 2014. Source: (Fraser Institute, 2014)
<b>Corruptions Perception Index (CPI)</b>	<b>Score; 42 out of 100. Rank: 72 out of 177 countries studied.</b>	The Corruption Perception Index (CPI) is reported annually by Transparency International, an international civil society organization. The CPI ranks countries in terms of the degree to which corruption exists in the misuse of public power for private benefit among public officials and politicians. CPI is a composite index determined by expert assessments and opinion surveys. The highest ranked country is the country with the least amount of perceived corruption. Index units, 10=least corrupt, 0=most corrupt. Data collected in 2014. Source: (Transparency International, 2014)

The indexes shown in Table 4 illustrate the difficulties investors in most sectors face in Brazil. Even though some of these indexes may have an overlap among some variables or factors considered, they do provide a useful indication of the absolute and relative performance of countries. In many of them, Brazil reaches relatively low scores and ranks, being found among

the countries that face the substantial challenges in the specific conditions measured. Under such contingencies, businesses are unlikely to prosper as much as they otherwise could. This performance also demonstrates that the private sector faces challenges to increase its contribution to the development of the country.

It is beyond the purpose and scope of this study to further analyze the results of such indexes. It suffices here, that they clearly show the challenges faced by investors to profitably operate in Brazil and the need for the adoption of strategic measures to further improve the business climate of the country.

Agriculture and forest businesses are also affected by many of the conditions that these indexes try to measure. However, due to their special characteristics, it is more useful to try to identify the principal factors that influence businesses in this sector, the relationships among them, and how they impact investment profitability. This modeling helps not only to understand the situations better, but also is critical for the design of actions that can improve the chances for entrepreneurs' success. These are the goals of the next section of the section.

### **Investment Support Institutions**

Brazil counts with institutions dedication to the promotion of business opportunities and support to investors. These institutions are found at the federal government level and some states also have established them. Here the main federal institutions will be presented. Due to number of states existing in Brazil, for this level, only brief reference will be made for the institutions from the states of Minas Gerais and Sao Paulo, the two that will be visit by the KGPA mission.

**APEX-BRASIL (Brazilian Trade and Investment Promotion Agency).** Apex-Brasil's services help investors to do business with Brazil. Apex-Brasil promotes investment opportunities to attract foreign investors to Brazil. The Agency focuses on companies and projects that offer technological innovations and new business models, strengthen industrial supply chains, have a direct impact on national job creation and improve the volume and diversity of Brazilian exports.

The Agency is prepared to assist in all steps of the investor's decision-making process. Her service portfolio ranges from identifying and contacting potential investors for a particular industry segment to supporting a future investor in its understanding of Brazil. APEX-Brazil prepare analysis covering industry sectors and markets, economic trends, and general guidelines on legal and fiscal matters, and provide information on input costs, suitable locations and talent pool availability.

Using an extensive network of companies, associations and authorities, Apex-Brasil also acts as liaison between potential partners, key suppliers and regulatory and local authorities.



The Agency also supports foreign investors willing to identify local companies, universities and research centers to establish partnerships, joint-ventures or other types of collaboration. Moreover, Apex-Brasil can help capital investors and in the process of identifying opportunities, projects and companies for venture capital and private equity investments in the country.

Apex-Brasil has assisted investors and industries from numerous countries in setting up new facilities, and, has played a key role in directing investments to Brazil. (MDIC, 2013)

Site: <http://www2.apexbrasil.com.br/en>

The **Minas Gerais State Investment Promotion Agency (INDI)** is the main gateway for investors to the State of Minas Gerais. Connected to the State Secretariat of Economic Development, the Agency provides a variety of services to entrepreneurs, such as tax guidance and negotiation of tax incentive policies, financing from state funds and financial solutions from the Minas Gerais Development Bank (BDMG), in addition to evaluation of projects on infrastructure, water supply, electricity, natural gas, among other resources. It also provides support in choosing the best location for new businesses and provides support in negotiations with cities and towns, and finally provides guidance and negotiation in aspects related to environmental licensing. In this context, INDI relies on its 45 years of experience working as an inducer for socio-economic and industrial development, making it possible for the state that the industrial history of Minas Gerais is strongly correlated with the history of the Agency itself. Sponsored by Cemig and BDMG, INDI is considered a national and international reference in terms of investment promotion. INDI's mission is to become a worldwide reference as the most effective productive investment promoter by 2018. (AMCHAM Brasil, nd).

Site: [www.desenvolvimento.mg.gov.br](http://www.desenvolvimento.mg.gov.br)

**Investe Sao Paulo** - Sao Paulo's Agency for the Promotion of Investments and Competitiveness – is the one-stop-shop for companies planning to set up in the State, in addition to stimulating the expansion of businesses already installed. In order to help investors find the best location for their project, taking into consideration the needs of each company, Investe Sao Paulo has a team of specialists offering free advisory.

The Agency is linked to the Secretariat of Economic Development, Science and Technology, and its role is to present to companies the benefits available in the tax legislation of Brazil and of the State of Sao Paulo. Besides, Investe Sao Paulo simplifies the process of obtaining environmental licenses and assists with the development of infrastructure around the site of the plant, taking care of all the necessary networking with authorities and entities at the municipal, state and federal levels, necessary for the installation of the project.



The agency also suggests policies to attract new investments, both nationally and internationally, to Sao Paulo, with the objective of stimulating the competitiveness of the economy, technological innovation, reduction of regional inequality and creation of jobs and income for the population.

Investe Sao Paulo's mandate also includes the reception of foreign delegations, presenting them with investment opportunities in the state, prospecting new businesses, supplying information that will contribute to the development of Sao Paulo and the promotion of the image of the State as the destination for new investments.

The agency has a portfolio of projects in diverse sectors and countries that amounts to potential investments of USD 13 billion, with the capacity to create 42 thousand direct and 180 thousand indirect jobs.

#### Main Activities

- Assist investors in setting up companies in the state;
- Stimulate the expansion of companies already set up in Sao Paulo;
- Assist investors in identifying a location for the project;
- Provide information about sectors and businesses in the state;
- Assist in obtaining licenses;
- Facilitate contacts with public and private entities;
- Contact similar entities, both domestic and international;
- Receive foreign missions;
- Organize overseas missions focus on attracting investments to the state of Sao Paulo;
- Promote the image of the State of Sao Paulo internationally.

(AMCHAM, 2011-2012)

Site: [www.investe.sp.gov.br](http://www.investe.sp.gov.br)

## State of Forest and Forestry

In comparison with other countries, Brazil is the second in area of native forests, has the greatest stock of carbon in the living forest biomass and is 8<sup>th</sup> in area of planted forests. (Serviço Florestal Brasileiro, 2013)

Brazil is the world's largest producer of industrial roundwood from forest plantations which indicates the high productivity of these plantations. A recent FAO publication (Jurgensen, Kollert, & Lebedys, 2014), using data for 2012 obtained from 78 countries, found Brazil to be the world's top producers of industrial roundwood based on forest plantations. On that year, Brazil's plantations produced 131.9 million m<sup>3</sup> of roundwood, double what the second largest producer; China produced (64.2 million m<sup>3</sup>).

This section presents data and information to describe and quantify the forest sector in Brazil, especially as related to forest plantations and businesses. For this, the section is divided in five parts. The first presents a table which summarizes the based numbers of the forest sector.

The second part concentrates in describing issues related to natural forests such as Brazil's biomes and vegetation cover.

Part three concentrates on issues related to forest plantations, not only describing their dimensions but also providing a discussion on forest financing and the prices of forest products.

The fourth part discusses and compares the concept of climate for forest based businesses in Brazil as a whole and how the country compares to the business conditions for forest investments in other Latin American countries.

The last part shows that the dimensions and varied natural and socio economic conditions found in the Brazil result in different businesses climate for forest investments. It presents the results of a study that measures forest business conditions for each state in the country.



## Basic Data

Table 5 summarizes some basic data about the Brazilian forest based sector.

**Table 5 - Basic data for the Brazilian Forest Based Sector**

<b>Land Area</b>	846 million hectares
<b>Agriculture land</b>	32.5%
<b>Forest covered land</b>	61.15%
<b>Arable land</b>	8.5%
<b>Land Steepness</b>	62% - < 8% steepness 35% - 8%-30% steepness 3% - > steepness 30% See to Annex 8 compare to other LAC countries
<ul style="list-style-type: none"> <li>• <b>Potential Equivalent Arable Land</b></li> <li>• <b>Desert areas</b></li> <li>• <b>Arid areas</b></li> <li>• <b>Potential Forest Vocation Land</b></li> </ul>	<ul style="list-style-type: none"> <li>• 394 million ha</li> <li>• 4.3 million ha</li> <li>• 65,5 million ha</li> <li>• 390 million ha</li> </ul> <p>For a comparison with other LAC countries see Annex 9</p>
<b>Terrestrial Protected lands</b>	26.3%
<b>Deforestation rate</b>	Average annual deforestation (2000-2010)= 0.5% (The World Bank, 2013)
<b>Natural forests</b>	456 million ha
<b>Planted forest areas</b>	5,105 million ha of <i>Eucalyptus</i> spp 1,560 million ha of <i>Pinus</i> spp 0,535 million of other species
<b>Public forests</b>	308 million ha
<b>Native forests production value</b>	Total USD 2.151 billion (2012 current) Charcoal USD 296 million Firewood USD 349 million Logs USD 1.027 billion



<b>Plantation forests production value</b>	Total USD 7.271 billion (2012 current) Charcoal USD 1.231 million Firewood USD 1.145 million Logs USD 4.820 billion [logs for Pulp & Paper USD2.311 billion]
<b>Forest products export</b>	USD 9 billion
<b>Forest products imports</b>	USD 2,4 billion

Sources: (Serviço Florestal Brasileiro, 2013), (The World Bank, 2013), (ABRAF, 2013)

## The Brazilian Natural Forests

Brazil's territory contains six continental biomes: Amazon, Cerrado, Pantanal, Atlantic Forest, Caatinga and Pampa, as shown in Map 7. The original cover of the three forest biomes represents 80% of Brazil's territory, with the Amazon covering around half of the country's total territory and the Cerrado occupying almost one quarter. The Atlantic Forest accounts for around 13%. A more detailed biomes map is provided in annex 1, another at a 1:5 000 000 scale can be found at (IBGE, 2014h). A biomes Map at 1:5 000 000 scale for the year 2004 can be found at (IBGE, 2014j).

**Map 7 - Principal Biomes of Brazil.**



Source: IBGE

Brazil's forests constitute 12% of the world's forest area, a quarter of the area covered by tropical forests and 35% of the world's tropical rainforests. The forests are responsible for a significant part of global land-based biodiversity. Brazil also has approximately 7 million ha of planted forest.

The remaining forests occupy 460 million ha (54% of the national territory). It is estimated that 82% of the original Amazon biome cover remains, while around 52% remains in the Cerrado and 14% in the Atlantic Forest. The smaller forest remnants are partly prone to processes that induce fires and forest degradation.

Brazil is identified as a megadiverse country with an extremely rich flora and fauna. Forty thousand different species of flora are already cataloged. Brazilian fauna is equally rich, although knowledge about all the species is still incomplete (it is estimated that less than 10% of the existing total is known). (Government of Brazil, 2012)

Most of the original ecosystems of the eastern highlands have been destroyed, including the once luxuriant hardwood forests that dominated the eastern seaboard and the formerly magnificent Paraná pine (*Araucaria*) forests that covered the southern plateaus. Monkeys, parrots, and other formerly common wildlife are now found only in zoos, private menageries, or small patches of forest that still support the original flora. Saltworks, marinas, and condominiums have replaced the former coastal waterways and swamps that once teemed with waterfowl and alligators.

The Brazilian savannas in the semiarid Northeast have no massive herds of wild animals like their African counterparts. Jaguars and ocelots once inhabited the forest edges, but they have been extensively hunted by ranchers and are now endangered. The plant life varies considerably from coarse bunchgrasses to thorny, gnarled woods known as *caatinga*, the name derived from an Indian term meaning “white forest”; most *caatinga* are stunted, widely spaced, and intermingled with cacti. Woodlands known as *agreste* are found in slightly more humid areas. Most areas of *agreste* are located near the São Francisco River and on elevated slopes, where some remaining moisture in the air is wrung from the trade winds. Thorny trees in those regions may attain heights of up to 30 feet (9 metres) and form barriers with their interlocking branches that even leather-clad *vaqueiros* (“cowboys”) cannot penetrate. Artificial pastures and grain fields have largely replaced the native grasslands of Rio Grande do Sul.

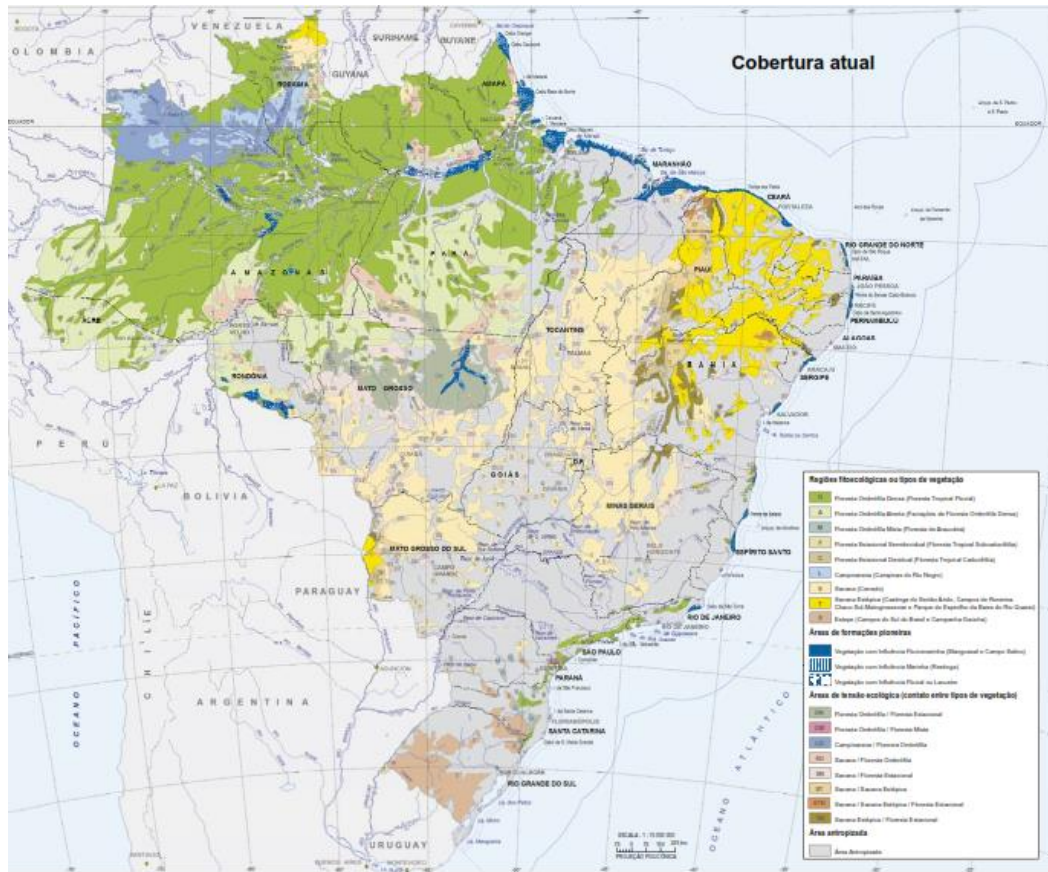
The Pantanal's vast sloughs and watercourses support an abundance of flora and fauna, including the giant *pirarucu*, a fish that is herded into enclosures like underwater cattle pens until needed for food. Aquatic birds include ibis, herons, ducks, and migratory geese. There are numerous lizards and snakes, including deadly *fer-de-lance* (*jararacas*) and rattlesnakes. Among the larger mammals are armadillos and anteaters, which prey on ants and termites, whose nests may stand more than 6 feet (2 metres) high. Rheas (the South American relative of the ostrich), roadrunners (*siriemas*), and a variety of game birds, notably quail and partridge, are ubiquitous to the Pantanal's higher ground and to the savannas of central Brazil.

The Amazon basin has the greatest variety of plant species on Earth and an abundance of animal life, in contrast to the scrublands that border it to the south and east. The Amazonian region includes vast areas of rainforest, widely dispersed grasslands, and mangrove swamps in the tidal flats of the delta. Individual plants of most species tend to be widely dispersed, so that blights and other natural threats cause them only limited damage. A typical acre (0.4 hectare) of Amazonian forest may contain 250 or more tree species (in contrast, an acre of woods in the northeastern United States might have only a dozen species).

The crowns of giant Amazonian trees form a virtually closed canopy above several lower canopy layers, all of which combine to allow no more than 10 percent of the sun's rays to reach the ground below. As a result, more plant and animal life is found in the canopy layers than on the ground. The tallest trees may rise to 150–200 feet (45–60 m) and are festooned with a wide variety of epiphytes, bromeliads, and lianas, while their branches teem with animal life, including insects, snakes, tree frogs, numerous types of monkeys, and a bewildering variety of birds. Several hundred bird species nest in the immediate vicinity of the main Amazon channel, and alligators, anacondas, boa constrictors, capybaras, and several smaller reptiles and mammals are found along the riverbanks. In the waters are manatees, freshwater dolphins, and some 1,500 identified species of fish, including many types of piranhas (not all of them flesh-eating), electric eels, and some 450 species of catfish. There may also be hundreds of unidentified species. (Encyclopædia Britannica, 2014)

Map 8 shows the current vegetation cover as of 2004 and older for selected areas.

**Map 8- Current Vegetation Cover**



Source: (IBGE, 2014k).

## Forest Plantations

The South and Southeast account for the majority of Brazil's timber production, about half of it from plantations of eucalyptus trees introduced from Australia; Honduras pine and several other exotic species are also harvested. The timber from plantations is used mainly to manufacture cellulose and paper products. Each year, Brazilians burn vast tracts of rainforest and wooded parts of the highlands to make room for pastures, crops, and settlements; however, few of the trees destroyed in that process are used for fuel, and almost none are used for wood products. Most of the small timber yield of the Northeast is used as fuelwood. The forests of eastern Minas Gerais produce the largest share of Brazil's charcoal, followed by those of western Maranhão, southern Bahia, and Tocantins. (Encyclopædia Britannica, 2014)

Table 6 shows the distribution among the principal land uses in the country. Notice that natural forests, mostly in the Amazonia, and conservation areas take a major chunk of the land resources. Forest plantations, according to this source, occupy only 5 million ha.

**Table 6 - Use of Land in Brazil**

Territory Distribution (million hectares)	
Amazon Rain Forest	345
Breeding Pasture	170
Protected Areas	55
Annual Cropping	47
Permanent Cropping	15
Cultivated Forest	5
Land used for other purposes (cities, housing, roads, etc.)	108
Areas unexploited and available to conversion for agriculture	106
<b>Total</b>	<b>851</b>

Source: IBGE and CONAB as adapted by (PricewaterhouseCoopers , 2012)

Even though commercial forest plantations compete for lands with steepness up to 8%, which are considered generally to be more prone to agriculture production, they are especially competitive in forest vocation lands (FVL). A back-of-the-envelope estimation (see Annex 9) of such lands in the country indicates that it counts with more than 390 million ha for which forest land uses are generally more competitive. It should be noticed, however, that these lands include protection areas, Indian lands, urban areas, and other set-asides that are unavailable for forest plantations. Nevertheless, even with these reductions, there are left millions of ha for which plantations and other forest uses are more suitable than agriculture and cattle raising uses.

Brazil is the world's largest producer of industrial roundwood from forest plantations. A recent FAO publication (Jurgensen, Kollert, & Lebedys, 2014) using data for 2012 obtained from 78 countries found Brazil to be the world's top producers of industrial roundwood based on forest plantations. On that year, Brazil's plantations produced 131.9 million m<sup>3</sup> of roundwood, double what the second largest producer; China produced (64.2 million m<sup>3</sup>). For comparison, the other countries that make up the top 10 roundwood producers from forest plantations are India (43.1 million m<sup>3</sup>), the United States of America (101.9 m<sup>3</sup>), Chile (38.4 million m), New Zealand (27.5 million m<sup>3</sup>), Australia (19.2 million m<sup>3</sup>), South Africa (15.9 million m<sup>3</sup>), Thailand (14.6 million m<sup>3</sup>) and Indonesia (12.5 million m<sup>3</sup>). They together produced 469 million m or 83 percent, of the global industrial roundwood production in plantations

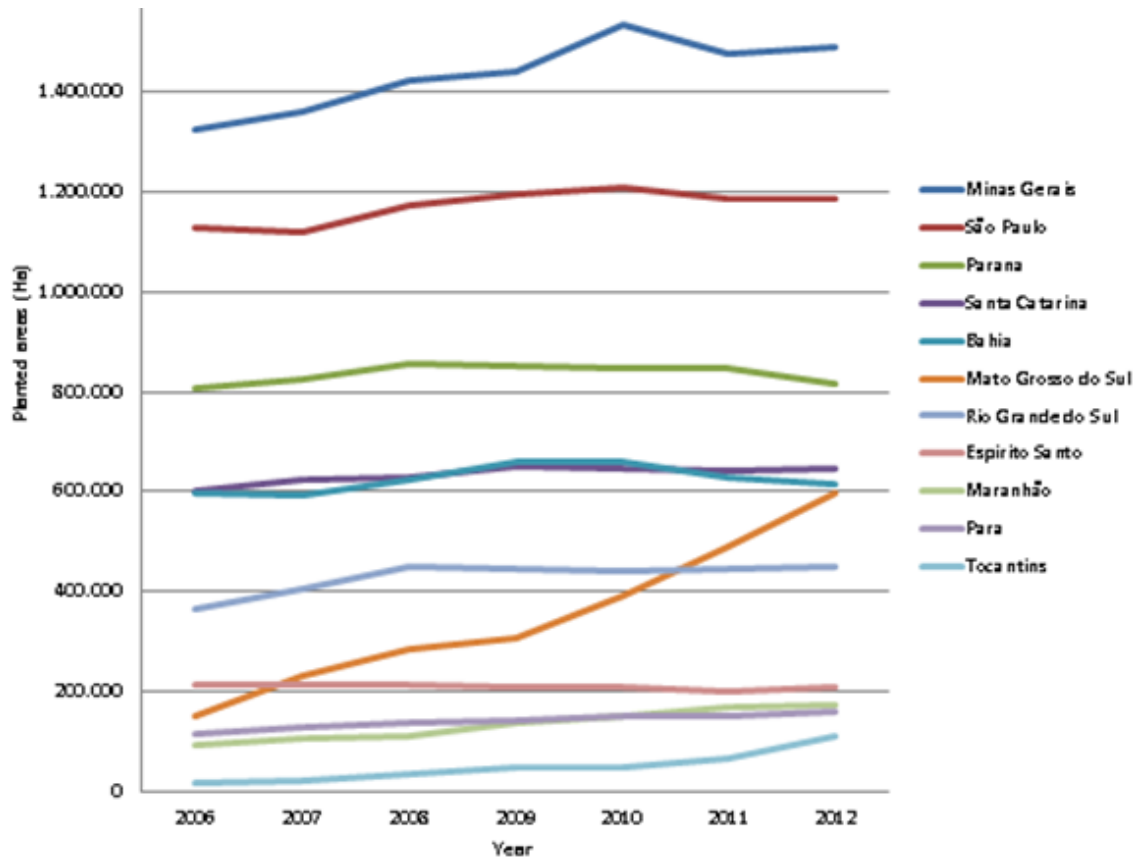
The productive chain of the Brazilian forest-based sector associated with planted forests is characterized by a great diversity of products, and encompasses the production, harvest and transport of wood as well as the production of end products in industrial segments such as Pulp and Paper, Industrialized Wooden Panels, Mechanically Processed Wood, Charcoal-fired Steelworks and Biomass, among others. In 2012, the sector's gross production value totaled BRL 56.3 billion, which is 4.6% higher than the figure for 2011. Taxes and tributes collected amounted to BRL 7.6 billion (0.5% of the domestic taxes collected). The commercial trade balance for forest-based industry (USD 5.5 billion), although 3.8% less than this value for 2011, increased its role in domestic trade surplus, moving from 19.1% to 28.1%. (ABRAF, 2013)

The evolution of plantation forests can be divided into three periods. Until 1966 they covered a small surface area and were geared towards the emerging steel industry and the railways. Then, from 1967 to 1987, there was a period of fiscal incentives and large afforestation programs, which led to some 4 million hectares being planted. This was followed by reduced planting from 1988, when the incentives were withdrawn, but this did not prevent the sector from becoming an important component of the national economy, with the pulp and paper sector attaining international importance and Brazil featuring as the world's leader in fast-growth, high-yield plantation techniques progressing from growth rates of 20m<sup>3</sup>/ha/year to 40 m<sup>3</sup>/ha/year. (FAO, 2014)

Figure 6 shows the annual plantation rate of forest by state for the period 2006-2012. The states with the largest stocks of planted forests are Minas Gerais and São Paulo. Notice that planted area growth has not been substantial for these states while others less traditional states such as Mato Grosso do Sul, Tocantins and Maranhão have increased relatively their plantations substantially. As a matter of fact, Mato Grosso do Sul and Maranhão have recently received, respectively, 3 and one new cellulose mills and expansions are already being planned.



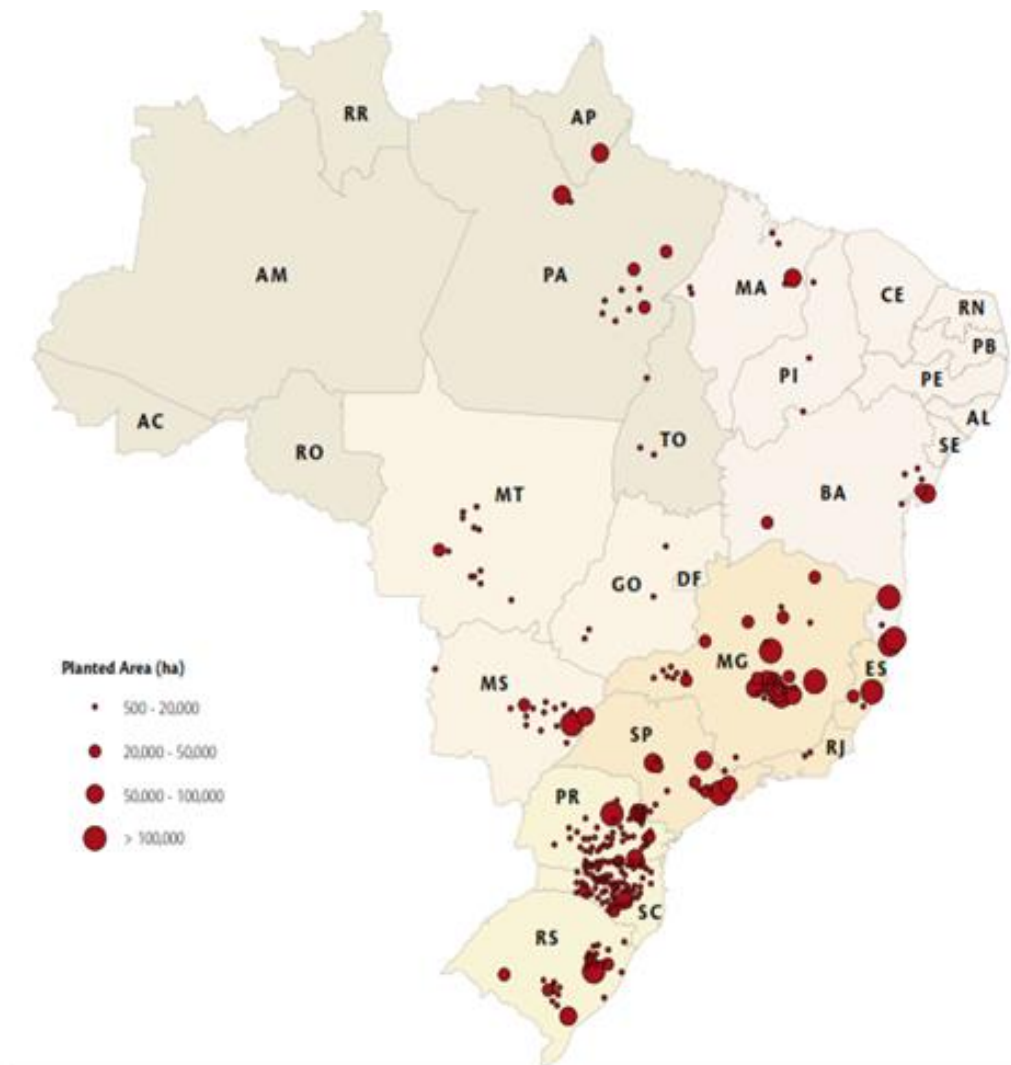
**Figure 6 - Total Forest Plantation Areas per Year and State, 2006-2012**



Source: Prepared by the authors with data from (ABRAF, 2013)

Map 9 shows more precisely the location of forest plantations in the country.

**Map 9 - Distribution of Forest Plantations by State, 2012**

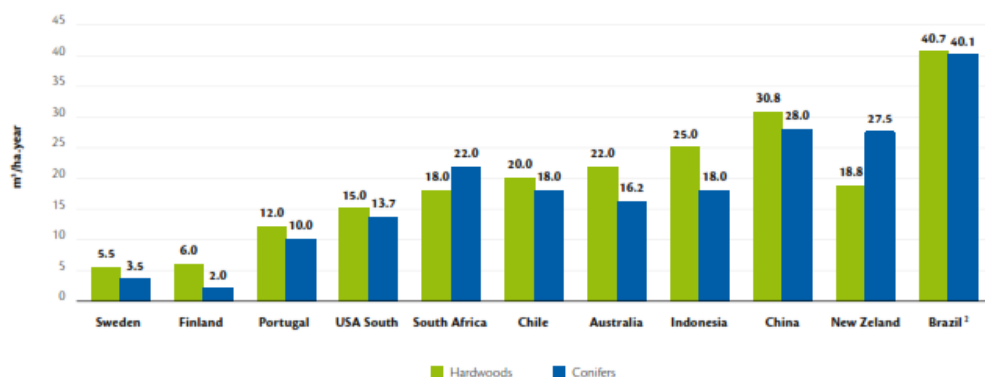


Source: (ABRAF, 2013)

Brazil is the country with the most productive planted forests in the world. As shown in Figure 7 its plantations reach more average commercial productivities of more than 40 m<sup>3</sup>/ha-year. At selected sites and using eucalyptus clones, the productivity can be double that productivity.



**Figure 7 - Comparative productivity of conifer and hardwood forests in Brazil and in other selected countries, 2012**



Source: (ABRAF, 2013)

In 2012, 35.2% of all wood coming from planted forest was used in the production of pulp; sawn wood, industrialized wood panels and plywood respectively accounted for 7.1%, 16.4% and 2,7% of the total wood produced. The remainder (38.7%) was used for firewood and other forest products.

### Species Planted and Production Systems

The principal species planted commercially in Brazil are of the genus *Eucalyptus* and *Pinus*. The stock of planted areas for *Eucalyptus* spp. is 5,10 million ha while *Pinus* spp. sum 1, 56 million up to 2012 (ABRAF, 2013).

There are nine *Eucalyptus* species usually recommended to be planted in Brazil and many precedencies and clones developed. The selection of species depends on the plantation site features and the purpose of the plantation.

**Table 7 - Indication of *Eucalyptus* species according to site conditions and purpose of use.**

Site location	Wood use	<i>Eucalyptus</i> species recommended	Species behavior
Regions subject to severe and frequent frosts	Energy purposes (firewood or charcoal) and sawmill	<i>E. dunnii</i>	It has a fast growth and good shape of the trees, with difficulties in seed production
Regions subject to severe and frequent frosts	Energy purposes (firewood or charcoal) and sawmill	<i>E. benthamii</i>	Good stem form, intense regrowth, easy seed production. Requires high volume of annual rainfall
Severe frost free regions	Energy purposes (firewood or charcoal), pulp, construction, and sawmill	<i>E. grandis</i>	Species with great volumetric efficiency and growth. Quality of the wood increases with age

Severe frost free regions	Energy purposes, lamination, furniture, structures, crates, posts, stanchions, posts, pulp	<i>E. saligna</i>	Wood denser than that of <i>E. grandis</i> ; less susceptible to boron deficiency.
Severe frost free regions	Energy purposes, sawmill, poles, stakes dormant structures, construction	<i>E. camaldulensis</i>	More twisted trees; recommended for areas with high annual water deficit.
Severe frost free regions	Energy purposes, sawmill, poles, stakes dormant structures, construction	<i>E. tereticornis</i>	Tolerant to water deficit, good regeneration by budding strains.
Severe frost free regions	Sawmill, laminating, joinery, sleepers, poles, posts	<i>Corymbia maculata</i> (ex - <i>E. maculata</i> )	Showed slow initial growth. Suitable for regions with high water stress.
Severe frost free regions	Energy purposes (power supply or charcoal), construction, rural use and agroforestry systems	<i>E. cloeziana</i>	Excellent stem form, natural durability, high resistance to insects and fungi.

Source: Adapted by the author from (Santos P. T., 2014) that cited (Paludzyszyn Filho, Ferreira, & Santos, 2006).

The production systems for eucalyptus species involve a series of activities that often also vary with site conditions, species selected, and plantation purposes. However, they usually include seed production, seedling production, site preparation, planting system (including agroforestry systems), forest protection (fire, diseases, plagues) and management.

There are several publications and technical articles covering these issues in the literature (Foelkel, 2014)(Biblioteca Florestal, 2014). The diversity of situations possible combining site conditions, species, purposes, and the several activities involved make it impractical to try to even summarize them in this report. It suffices to advert of the need for professional project design and implementation and to refer to publications dedicated to the provision a more detailed presentations of these issues. Here, the author recommends specially that (Vale & eds., 2014) and (Santos P. T., 2014) be consulted.

The principal species of the genus *Pinus* planted in Brazil are *Pinus caribaea*, *Pinus taeda*, and *Pinus elliottii*. Combined they sum more than 1,7 million ha planted in South and Southeast regions, distributed (decreasing order) in the states of Paraná, Santa Catarina, Rio Grande do Sul, and São Paulo. According to (ABRAF, 2013), the area planted with *Pinus spp* is being reduced and there is a tendency of substituting it with *Eucalyptus spp*.

The production systems for *Pinus spp* involve a series of activities that may also vary with the site conditions, species selected, and plantation purposes. However, they usually include seed production, seedling production, site preparation, planting system (including agroforestry systems), forest protection (fire, diseases, plagues) and management.

**Table 8 - Indication of *Pinus* species according to site conditions and purpose of use.**

Site location	Wood use	<i>Pinus</i> species recommended
Frost free tropical climate regions	Sawmill, fiberboard and resign	<i>P. caribaea</i> var. <i>hondurensis</i>
Frost free tropical climate regions. Develops well in heights superior to 700 m	Sawmill, denser wood, and resign	<i>P. caribaea</i> var. <i>bahamensis</i>
Frost free tropical climate regions	Sawmill, fiberboard and resign	<i>P. caribaea</i> var. <i>caribaea</i>
Cool to cold weather, and well distributed rainfall, well drained soils	Pulp, sawmill, fiberboard, laminating, pulp.	<i>P. taeda</i>
Frost free tropical climate regions. Develops well in low altitudes	Sawmill, fiberboard and great producer of resign	<i>P. elliottii</i>

Source: prepared by the author from (Aguiar , 2014)

There are several publications and technical articles covering these issues in the literature. The diversity of situations possible combining site conditions, species, purposes, and the several activities involved make it impractical to try to even summarize them in this report. It suffices to advert of the need for professional project design and implementation and to refer to publications dedicated to the provision a more detailed presentations of these issues. Here, the author recommends specially that (Aguiar , 2014) and (Foelkel, 2014) be consulted.

### Forest fires, diseases, and plagues

Around 160.000 forest fire events occur in Brazil every year (Figure 8). In 2012, it affected more than 2 million ha throughout the country (Figure 10).

Fire has been a traditional land management tool in the country for centuries. They were already used by indigenous groups before the arrival of the Portuguese. Fire has been used to clear forested areas, to renew pasture lands, to eliminate crop residues, and for other purposes.

Forest fires do not occur with equal frequency during all months of the year mainly due to weather conditions. They occur more often during the dry season of the specific region of the country when biomass humidity is lower (see Figure 9, section on climate and rainfall and Annex 10). Fire events vary between regions of the country not only due to climatic conditions but also due to differences in the levels of agricultural and forestry activities.

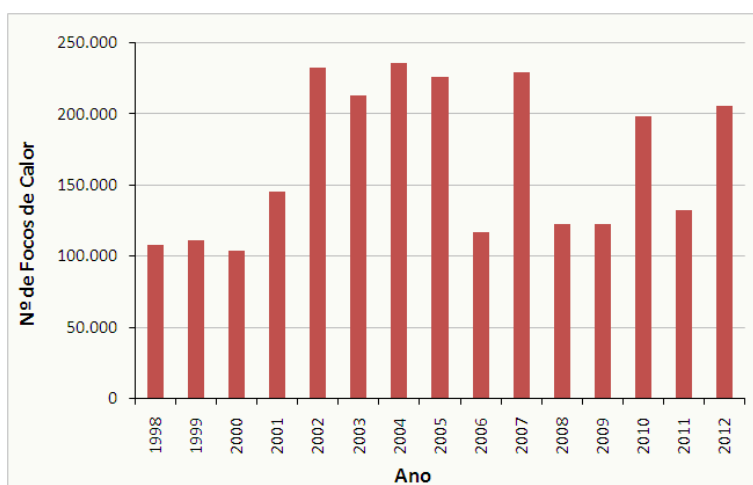
Likewise, the fires are not uniformly distributed through the forest areas. There are places where fire occurrence is more frequent, such as near the villages of camps, margins of highways, railroads, nearby agricultural areas and pastures.

To this matter, since 1998, INPE provides hotspots, daily, from multiple satellites. The data are loaded in the information system of IBAMA. Through a geographic information system, satellite

images and various databases with detailed information about all the national territory, the monitoring team identifies areas of risk for fires (This includes natural and planted forests).

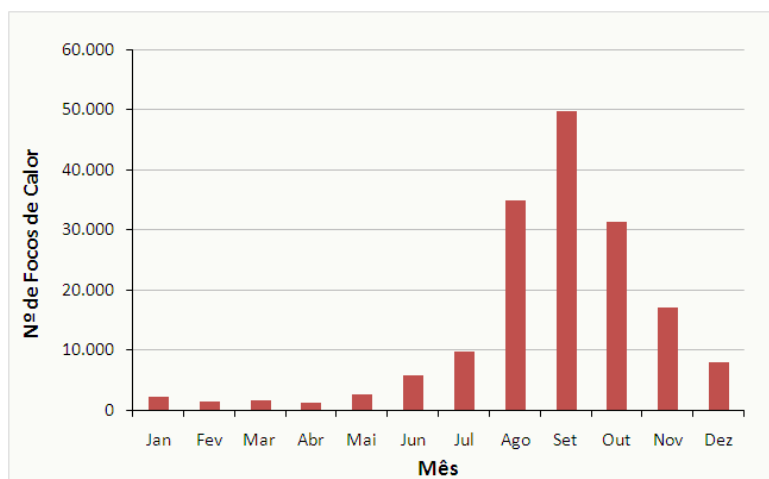
The hot spots detected in the areas of risk enter an alert system that classifies them according to the persistence, the location and the risk offering. The system can be accessed by the public at (PREVFOGO, 2014).

**Figure 8 - Total number of hotspots detected per year (1998 - 2012)**



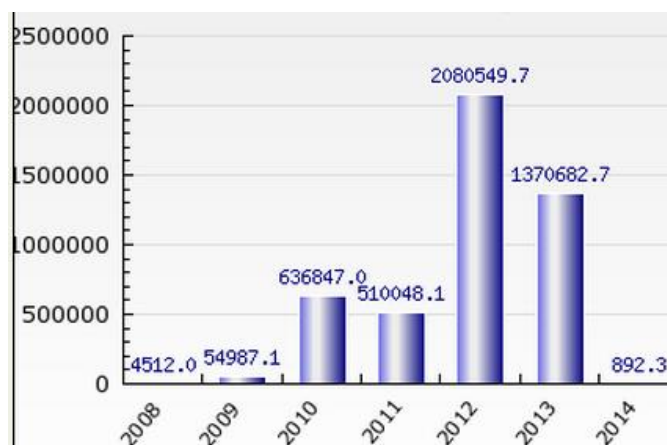
Source: (PREVFOGO, 2014)

**Figure 9 - Monthly average of hotspots (Jun 1998 - Dec 2012)**



Source: (PREVFOGO, 2014)

**Figure 10 - Area affected by forest fires (2008-Jul/2014. In ha)**



Source: (PREVFOGO, 2014)

The development and proper implementation of forest plantation fire prevention, monitoring and combat is an essential part of a well designed and implemented forest management plan. Forest fire protection is well understood and the country counts with expertise and experience in these matters (Ribeiro & Martins, 2014).

Combined with other activities to protect plantations from diseases, pests, and theft these activities are crucial to avoid losses in a plantation business.

The main pests of economic importance in eucalyptus plantations are termites, cutting ants, leaves caterpillars, leaves beetles, borers and root beetles. "Besides these, exotic pest recently introduced into the country has been causing serious damage. Among them are the opsilídeo shell, "percevejo" and the branch wasp. In Brazil, the most attacked species are *Eucalyptus camaldulensis*, used in the production of firewood and charcoal, *E. urophylla* and hybrid *E. urograndis* (*E. urophylla* x *E. grandis*), used in the production of pulp, paper and fiberboard.

Eucalyptus can be attacked by pathogens, especially fungi, from the nursery to established plantations. The mains diseases are rust caused by the fungus *Puccinia psidii*; "Damping off", caused by the fungus *Botrytis*, *Cylindrocladium*, *Fusarium* and *Rhizoctonia* in the stages of germination, emergence and post-emergence, destroying the seedlings; "Cancro" (Cancer) caused by the fungus *Cryphonectria cubensis*, this disease is characterized by the drying of the canopy and death of young trees as a result of strangulation of the base of the trees; "Powdery mildew" which is caused by the pathogen *Oidium sp.* This fungus attacks several species of eucalyptus in nursery conditions, greenhouse and field. The most susceptible species to this disease is the *Eucalyptus citriodora*; "The gray mold disease" which is caused by the pathogen *Botrytis cinerea*, being commonly found in nurseries with high density of seedlings (700 seedlings / m<sup>2</sup>), under conditions of high humidity (above 70%) and mild temperatures (autumn and winter).

There are still a large variety of diseases that can affect Eucalyptus plantations, although they are all described in technical and academic literature. Its control includes maintaining adequate phyto sanitary conditions in nurseries and plantations.

In the case of the *Pinus* trees, the main pests of economic significance are cutting ants, wood wasp, giants-pine-aphid and pine-weevil's. As for diseases, the pine can also be attacked by pathogens, especially fungi, from the nursery to established plantations. The major disease problems in pines are: damping off; root rot; rotting piles, seedlings burning pointers; drought pointers by *Sphaeropsis*, *Armillariose*, root rot by *Phellinus*, burning needles by *Cylindrocladium*, bluish stain, absence of mycorrhizae and sooty mold.

All pests and diseases of pine and eucalyptus have efficient control systems which are already well established in the country. In addition, there is a vast literature available regarding the action of each type of plague and disease in each region of the country. EMBRAPA, provides a technical guide to the major national cultivars (included forests plantations) which includes, in addition to technical aspects of the implementation and maintenance of plantations, their main pests and diseases of economic importance.

Further information on *Eucalyptus ssp* diseases and plagues in Brazil can be found at (Zanuncio, Zanuncio, & Pinto, 2014); (Alfenas, Ferreira, Mafia, & Zauza, 2014) and (Santos P. T., 2014).

## Plantation Costs

As explained above, the specific production system to be selected for a plantation depends on many variables. Hence, plantation costs vary substantially with the contingencies of a given project such as: the site location, road infrastructure available and distance to input suppliers; input prices; topography; soil conditions, correction and fertilization needed; current cover; ants and termites presence; mechanization possibilities and machines available; species selected and seedlings costs; local labor costs; spacing among plants; purpose of the plantation; rotation cycle; water conditions; time of year of the plantation; roads and forest protection costs; weeding costs, etc.

It is, therefore, only possible to provide a very tentative estimate of these costs. The concrete costs can only be estimated more precisely when the specific contingencies of the project are better known.

As an illustration, Table 9 presents the establishment and management cost per ha estimated by (Instituto FNP, 2012) for an Eucalyptus (*E. grandis* or *E. urograndis*) plantation in Minas Gerais, with spacing of 3x2 m (1.660 plants/ha), with first cut in year 6 with an estimated production of 300 m<sup>3</sup>. This estimation considered mechanized and manual operations, inputs of fertilizers, PH correction, herbicides, pesticides, hydrogel, and administrative costs

**Table 9 - Costs of establishment and management of *Eucalytus* plantation.**

Item	R\$/ha	USD/ha equivalent**
<b>Plantation establishment</b>	3609,74	2.263,02
<b>Management (years 1-5)</b>	2.956,45	1.853,46
<b>Total cost/ha</b>	6.566,19	4.116,48
<b>Total cost/m<sup>3</sup>*</b>	R\$12,03	USD7,54

\* Standing tree cost. Does not consider harvesting and transportation costs.

\*\* R\$1=USD1,5951

Source: (Instituto FNP, 2012)

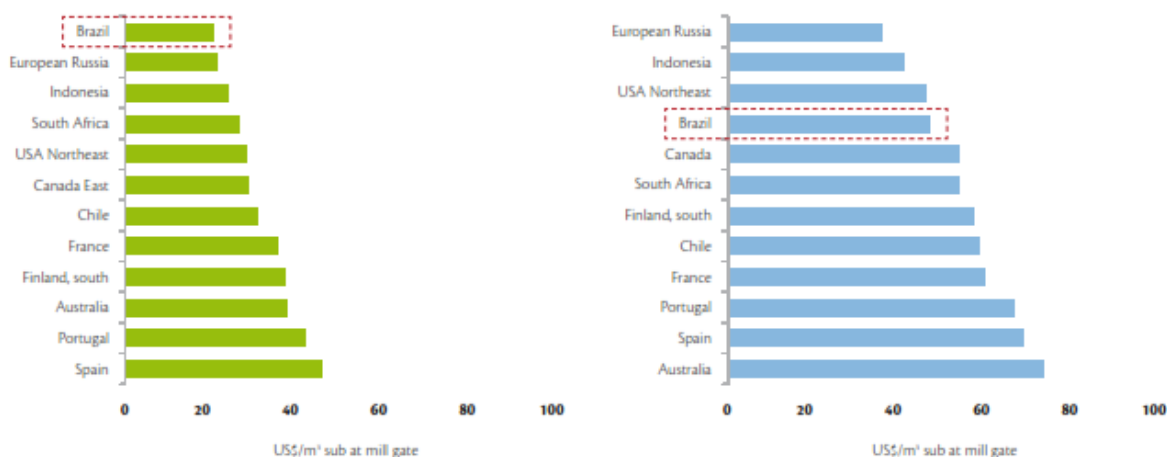
Brazil has been historically very competitive in producing wood in plantations. Figure 11 shows, however, the deterioration in the competitiveness of planted forest production as compared to that of the main international competitors.

At the beginning of the 2000 decade, Brazil enjoyed international status as the country with the lowest production costs for wood for process. In 2012, it has fallen four slots. It is more expensive to produce wood for the pulp industry in Brazil than it is in Russia, Indonesia and the United States.

Several circumstances are leading to this relative loss of competitiveness, most related to policy issues which are commented below. They have led to some uncertainties and increased cost for all similar sectors of the economy. Nevertheless, there ways to overcome many of these issues with careful planning and operation of forest plantation businesses.



**Figure 11 - International Benchmarking of Production Costs for Wood Production from Planted Forests**



(ABRAF, 2013)

## Prices for Forest Products

Prices of wood and its derivatives have risen in recent years due to growth in the domestic and international markets, which has pressured increased demand for forest products, in turn impacting the attractiveness of forest business and expansion of the country's planted area.

Figure 12 presents the evolution of forest products prices as compared to the inflation index IPCA.

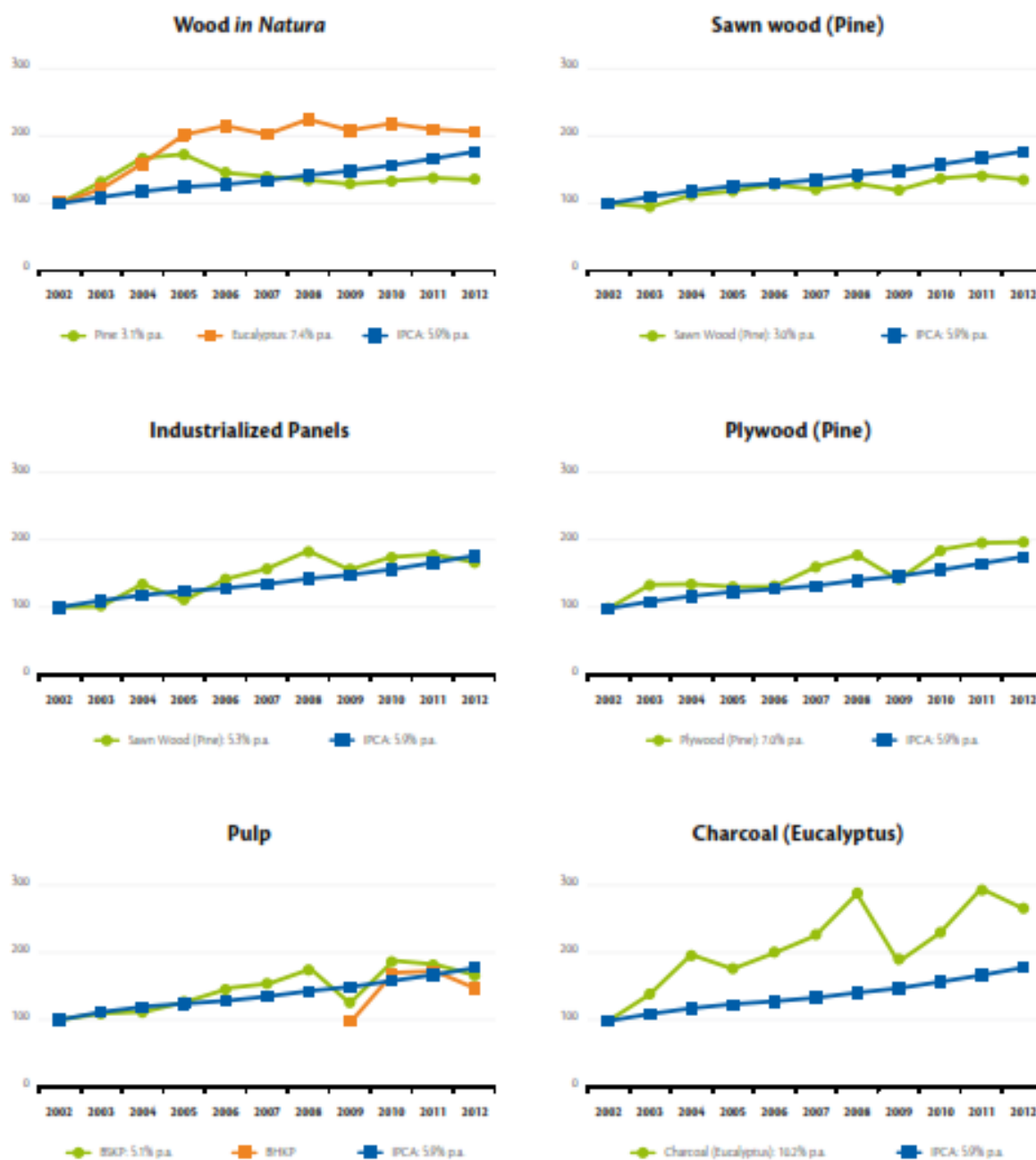
Log prices reached their peak in 2005 (for pine wood), and in 2006 (for Eucalyptus), and lost value in the following years as a result of the impact of the North American financial crisis. For the period 2009-2012, prices fell as a result of decreased demand from the external market, principally with relation to the wood industry (sawnwood and plywood).

The other products derived from the forest base also followed the rising trend until 2008, destabilizing along with the world economic crisis and re-establishing themselves on the path to recovery of pre-crisis price levels, as seen in the last two years. (ABRAF, 2013)

Prices alongside at Japan dock of Brazilian hardwood chips exported to that country was USD99.00 per green tonne in the 4<sup>th</sup> quarter of 2013, the second cheapest among its main sources of chip imports (RISI, January, 2014).

According to ITTO, *Eucalyptus* sawnwood prices in the domestic market (green ex-mill) in June 2014 was USD251.00 while pine varied from USD196.00 (air dried) to USD209.00 (kiln dried) per m3 (ITTO, 2014).

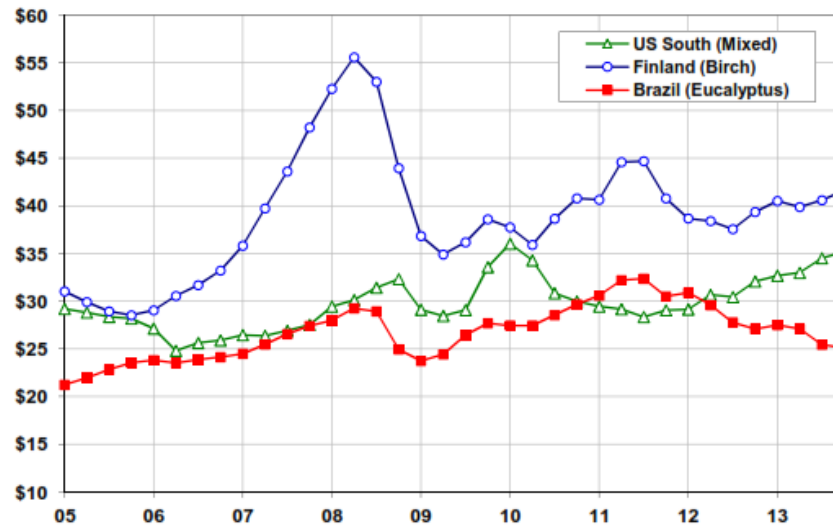
**Figure 12 - Change in nominal Prices for Forest Products and their derivatives (base index 100 = 2002)**



Source: (ABRAF, 2013)

Prices in Brazil for hardwood pulpwood (eucalyptus) are quite competitive in those in other competing countries, as seen in Figure 13.

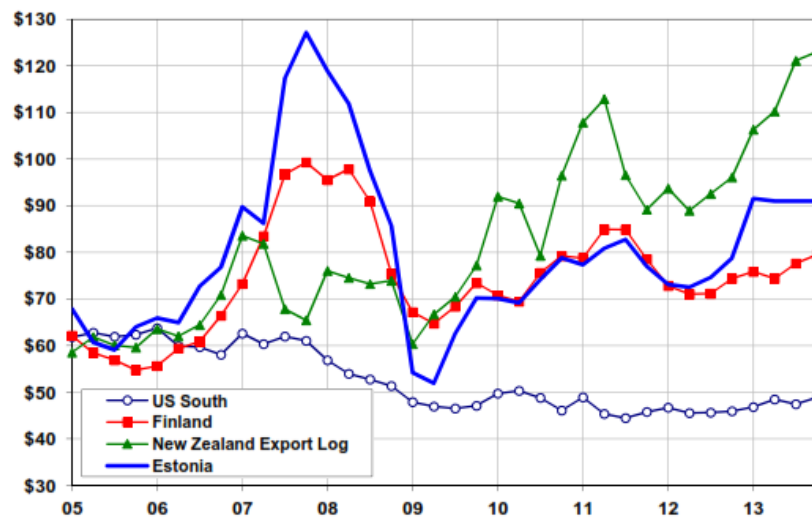
**Figure 13 – International Hardwood Pulpwood Prices. USD/m<sup>3</sup>, Quarterly**



Source: (RISI, January, 2014)

Prices of pine sawlogs in Brazil in 2013 varied from USD48.00 to USD52.00 per m<sup>3</sup> which was one of the cheapest in the world that year as can be seen in Figure 14 (RISI, January, 2014).

**Figure 14 - Pine Sawlog Prices. USD/m<sup>3</sup>, Quarterly**



Source: (RISI, January, 2014)

The average charcoal price produced from plantation forest in Minas Gerais for the month of March 2014 was R\$600,00/mt or USD272,00/mt<sup>14</sup> (SEAPA-MG, 2014).

## Plantations for Charcoal Production

One of the unique features of the forest sector in Brazil is the important use of forest biomass in the form of charcoal, mostly produced from planted forests, as a source of heat and carbon in the steel industry in carbon neutral manner. Box 1 presents some selected facts that give a better appreciation of this substantial source of demand for wood products.

Wood has also been used in electricity co-generation arrangements in the forest industry, in many cases not only supplying their own needs but also selling the surpluses to the grid. More recently, wood biomass thermal electric plants are entering the electric supply of the country.

### Box 1 - Charcoal, the Steel Industry, and Forest Plantations

1. Brazil has 29 steel mills with an installed capacity of 48.8 million tons / year;
  2. The country is the 13<sup>th</sup> largest steel exporter in the world with a trade surplus of USD 2.5 billion per year in this sector;
  3. Part of this steel is produced using as input pig iron produced with charcoal;
  4. Brazil is one of the only and the largest producer of pig iron using charcoal;
  5. Brazilian pig iron production in 2012 was 32.4 million tons, 24.6 million tons using coke and 7.9 million using charcoal as an input to the reduction of iron ore;
  6. (D'Ávila, 2014) estimated a production of 15 million tons of pig iron in 2020 using charcoal;
  7. The total installed capacity for the production of charcoal based pig iron in Brazil is 15 million tons per year, 8.3 million of which are in the state of Minas Gerais;
  8. Independent mills, integrated and semi-integrated steel mills located in Minas Gerais produce over 50% of the pig iron in Brazil, the largest part of the production (up to around 70%) is sold in the domestic market;
  9. Integrated plants of pig iron accounted for 84% of Minas Gerais production while the balance is comes from independent producers;
  10. In the production of steel, pig iron produced with charcoal is more competitive than the pig iron produced with coke or recycled steel (D'Ávila, 2014);
  11. The consumption of charcoal to supply the pig iron production in Minas Gerais was 8.2 million m<sup>3</sup> of charcoal in 2012, but the last decade has had its peak of nearly 18 million m<sup>3</sup> in 2004. This current low consumption is related to prevailing economic conditions in domestic and international steel markets.
  12. Ferroalloys producers in Minas Gerais also are important consumers of charcoal.
- Sources: (SINDIFER-MG, 2013) and (D'Ávila, 2014)

In 2000, Brazil was the world's 5th largest producer of pulp (long and short fiber), exceeded only by the United States, Canada, Japan and Finland. Today, the country is the world's 3rd largest producer of pulp among integrated producers, behind only the United States and Canada, and takes first place among independent producers.

<sup>14</sup> Average monthly exchange rate for March/2014 was considered to be USD1,00=R\$2,20.

Over the last ten years (2002-2012), the domestic pulp industry has grown an average of 5.7% p.a., reflecting the increase in exports to the Asian and European markets. In 2012, pulp production totaled 13.9 million tons and consumption reached 5.8 million tons, registering a drop of 0.1 million tons compared to the previous year.

It should be noted that, except for firewood, charcoal, sawn wood and industrialized wood panels (the consumption of which is basically concentrated in the domestic market), the other products are primarily aimed at the foreign market. A significant portion of the products from tertiary processing industries (furniture, paper, floors, frames, etc) is also exported, showing the importance of the international markets to the Brazilian forest sector. (ABRAF, 2013)

## Forest Financing

Investors can access several credit lines that seek to support specific activities related to forest business in Brazil. Most of these funds have some subsidy built in the interest rate as compared to the Market rate. Public development financing institutions at federal and state levels operate these lines. Annex 14 summarized these credit lines as they existed for the 2013 fiscal year.

It is noteworthy that Brazil has created a special credit line to support the implementation of production Technologies that reduce greenhouse gases (GHG) emissions from agriculture and promote carbon sequestration through forest plantations.

The Brazilian agricultural sector already has available many proven sustainable production technologies that can be adopted to reduce GHG emissions and capture and increase carbon stocks in biomass and soil. As part of the National Policy on Climate Change (PNMC), Brazil has developed the Sectoral Plan for the Mitigation and Adaptation of Climate Change for a Low Carbon Emission Agriculture, also known as the ABC Plan (Low Carbon Emission Agriculture Plan) to increase the rate of adoption of such technologies by the private sector. The overall objective of the ABC Plan is to ensure the continued improvement of sustainable management and use of natural resources by the agriculture sector, with a view to reducing greenhouse gas emissions and enhancing CO<sub>2</sub> uptake on the vegetation and soil, while increasing productivity.

The main tool of the ABC Plan is a special credit line that can be accessed by rural producers who adopt good agronomic practices that reduce the impact of greenhouse gas emissions. The terms offered by the ABC credit line are much more attractive than the regular rural credits, serving as incentive for farmers to convert their traditional agriculture practices to low carbon ones.

The plan comprises seven programs, six of which refer to mitigation techniques and activities for adapting to climate change. The mitigation techniques supported by the ABC Plan were selected among those verified by EMBRAPA as the most adequate for the different Brazilian conditions and which can produce clear reduction of GHG emissions without compromising productivity.



The techniques eligible under the ABC Plan, always in areas previously converted, are: (i) no-tillage planting; (ii) recovery of degraded pasture land; (iii) crop-livestock-forest integration system; (v) planting of commercial forests; (v) biological nitrogen uptake; and (vi) treatment of animal waste. (Government of Brazil, 2012)

## **Brazil's Forest Business Climate as Compared to other LAC Countries**

This section discusses a model that tries to identify the factors and relationships that affect the success of businesses in agriculture, forestry, and rural sector, which are critical for development in rural areas. To take advantage of the substantial natural resources that Brazil has and allow them to become a source of prosperity, it is needed to understand such factors. That understanding would also allow the identification of the critical intervention leverage points to improve the conditions that facilitate the profitable and sustainable operation of private businesses. The model presents a framework that helps in the development of strategies and the identification of measures to improve such conditions.

One example of index that tries to measure the business climate for forest based investments is the Forest Investment Attractiveness Index (IAIF, from the Spanish acronym). The IAIF's purpose is to clarify governments, investors and other stakeholders which are the factors that affect, lead to success, and attract private direct investment, domestic or foreign, to the forestry sector.

This Index seeks to measure countries' attraction for direct investment in sustainable forestry business. The IAIF allows: (i) to compare the performance of countries in the same year and the trend over time, (ii) to assist investors to pre-identify the countries where sustainable forest business will most likely be successful, and (iii) to clarify for countries which SUPRA, INTER and INTRA factors most affect their business climate for sustainable forestry investments.

The IAIF methodology considers 80 variables that make up a total of 20 indicators (several of them, exclusive) that are integrated into a model that seeks to explain and predict levels of direct investment in the sector. The IAIF was applied to the IDB borrowing countries based on data from 2004 and 2006. The results achieved for 2006 and furthers details about IAIF's methodology are presented in Annex 11.

Table 10 shows the detailed IAIF results for indicators and sub indexes for Brazil calculated using 2006 data.

**Table 10 – 2004 and 2006 IAIF scores LAC countries**

Country	IAIF 2006	IAIF 2004	Difference
<b>Brazil</b>	<b>60</b>	<b>60</b>	<b>0</b>
Chile	53	53	0
Argentina	47	44	+3
Uruguay	47	44	+3
México	44	40	+4
Panamá	44	37	+7
Colombia	44	40	+4
El Salvador	43	33	+10
Bolivia	41	34	+7
Peru	39	33	+6
Costa Rica	39	41	-2
Guatemala	38	30	+8
Haiti	36	23	+13
Nicaragua	36	34	+2
Trinidad y Tobago	36	33	+3
Suriname	36	34	+2
Venezuela	35	35	0
Belize	34	31	+3
Honduras	34	31	+3
Paraguay	33	31	+2
Ecuador	32	25	+7
Dominican Republic	32	32	0
Guyana	32	32	0
Average	40	36	+4
MIN	32	23	+9
MAX	60	60	0

Source: See more details in Annex 11

Brazil, according to this Index, is the most attractive country for investment in forest based businesses in Latin America and the Caribbean region. However, it reaches only 60 out of a total of 100 points possible, implying that there is much room for improvement in the conditions that lead to greater investments in the sector. This can best be seen by identifying the indicators that have the greatest potential for improvement when one compares the 2006 performance with the theoretical possible score which is shown in the last column of the Table 11. For instance, the IAIF indicates that Inter Sectorial factors such as Labor, Licenses and Permits, Property Rights, and Capital and Foreign Investment Flow can more than double their performance, while Intra Sectorial factors such as Favorable Support, Forest Resources and Adverse Actions can be almost three times better.



**Table 11 - Brazil's Performance in the IAIF 2006**

Indicators / Sub index / IAIF	Rating in 2006	Max. rating possible	Potential growth in %
GDP Growth Rate	75	100	34
Passive Real Interest Rate	97	100	3
Exchange Rate Stability	100	100	0
Trade Openness	58	100	72
Political Risk	67	100	50
Tax Share of GDP	53	100	90
<b>SUPRA Sectorial Sub index</b>	<b>75</b>	<b>100</b>	<b>34</b>
Economic infrastructure	62	100	61
Social Infrastructure	79	100	26
Licenses and Permits	50	100	100
Labor	39	100	156
Capital Market	55	100	82
Property Rights	50	100	100
Capital and Foreign Investment Flow	50	100	100
Agricultural Policies	57	100	76
Planting and Harvesting Restrictions	52	100	91
<b>INTER Sectorial Sub index</b>	<b>55</b>	<b>100</b>	<b>82</b>
Forest Resources	40	95	138
Favorable Support	37	100	168
Domestic Market	95	100	5
FVL	80	100	25
Adverse Actions	42	100	137
<b>INTRA Sectorial Sub index</b>	<b>59</b>	<b>99</b>	<b>68</b>
<b>IAIF</b>	<b>60</b>	<b>99</b>	<b>65</b>

Source: Annex 11

Growth potential for the Brazilian IAIF is 65%, pointing to the existence of substantial room for implementing policies aimed at improving the attractiveness of forest investment. The detailed analysis of the indicators that form the Index suggests the priority areas for intervention.

The model discussed here is helpful to understand the current situation of a country, how its performance compares with others, what its potential performance could be if all factors could be made to reach their maximum scores, and how to identify priority areas and actions to create an action plans to improve such business climate. To design these plans, however, it is necessary to undertake a detailed and periodic planning process that can systematically identify the priority factors, analyze their current and potential situations, and design interventions to move the future expected situation towards a desired future or vision for the sector.

It is beyond the scope of this study to calculate the most recent score Brazil can obtain in the corresponding indicators for agriculture related investment attractiveness. It is, however, strongly recommendable that such calculation be undertaken periodically not only for this country, but also for other nations. Besides its use in the design, monitoring and evaluation of interventions, this periodic calculation would allow several types of comparisons among countries, promote healthy competition among them, and help investors select the best countries to establish their agriculture and forest businesses.

Nevertheless, the present discussion and that of other sections of this study does provide sufficient information for the preparation of a framework that includes the design of interventions to improve the business climate for agriculture, forest, and rural investments in Brazil. This is the purpose of a latter section of the present study.

### **Forest Business Climate for Brazilian States<sup>15</sup>**

For large countries such as Brazil with substantial regional differences, aggregate number in an Index brings only limited information to investors. The provision of more detailed information may improve investors decision making and can be done through the development of state level models of investment attractiveness and calculate sub national indexes such as the Brazil Index for Forest Investment Attractiveness

In the case of Brazil, country of significant regional disparities, one single measurement in national scale of the business climate is not enough in order to orient the government, investors and other stakeholders about forest business in the country. In this context, the IAIF-BR 2009 (Forest Investment Attractiveness Index for Brazilian States) identifies and measures the factors in the state level that affect the local climate for forest business and how to improve them in order to attract more investments to the private sector.

The IAIF-BR is composed by three subindexes to analyze the attractiveness of a given State to the investment in the forest sector:

- a. SUPRA Sectorial Subindex: refers to the macroeconomic factors and to other factors that affect the profitability of businesses in all productive sectors of a State;
- b. INTER Sectorial Subindex: refers to the factors, generated in other economic sectors that affect the profitability of forest-industrial businesses; and
- c. INTRA Sectorial Subindex: refers to the factors that are inherent to the forest sector and that affect the profitability of forest-industrial businesses.

Considering the consolidated results of the IAIF-BR (see Table 12) the more attractive State to forest investments is São Paulo with 52 points, followed by the Minas Gerais State with 50

<sup>15</sup> Mostly extracted from (IDB, 2009)

points. These States has large industrial parks, forest resources, mainly planted forests, and a great domestic market.

Follow them are Paraná, Rio Grande do Sul, Bahia, Amazonas, Pará, Mato Grosso do Sul, Santa Catarina, Tocantins and Piauí. In this group are the States with favorable forest sector (Paraná, Rio Grande do Sul, Bahia and Santa Catarina), regions considered as new frontiers to forest investments (Mato Grosso do Sul, Tocantins and Piauí) and, finally, States with a high potential in native forests (Amazonas and Pará).

Among the last positions of IAIF-BR are the States with relevant forest potential, as Amapá (23th), Roraima (25th), Rondônia (26th) and but due low results in SUPRA and INTER sectorial factors, they did not reach better position in the IAIF-BR final classification.

**Table 12 - IAIF-BR 2009 Ranking**

	State	SUPRA-BR Subindex	INTER-BR Subindex	INTRA-BR Subindex	IAIF-BR
1	São Paulo (-)	53	52	52	52
2	Minas Gerais	58	46	49	50
3	Paraná (-----)	53	50	31	40
4	Rio Grande do Sul (-)	54	48	32	40
5	Bahia (-)	57	47	31	39
6	Amazonas (-)	68	45	29	39
7	Pará (-----)	61	44	31	39
8	Mato Grosso do Sul (-)	59	51	27	38
9	Santa Catarina	50	51	28	38
10	Tocantins (-----)	51	50	28	38
11	Piauí (-----)	62	48	26	38
12	Espírito Santo (-----)	64	47	26	38
13	Rio Grande do Norte (-----)	59	49	26	37
14	Goiás (-----)	46	49	27	36
15	Mato Grosso	42	47	28	36
16	Sergipe (-----)	57	45	26	36
17	Pernambuco (-----)	64	47	22	35
18	Maranhão (-)	54	44	25	35
19	Acre (-----)	61	43	24	35
20	Ceará	62	48	21	35
21	Distrito Federal (-)	59	56	17	34
22	Paraíba (-----)	53	45	24	34
23	Amapá (-----)	55	48	21	34
24	Alagoas (-----)	58	47	19	32
25	Roraima (-----)	54	44	19	31
26	Rondônia (-)	46	41	21	30
27	Rio de Janeiro	38	46	18	29

(-) Each symbol '-' is equivalent to the quantity of average data used to the IAIF-BR calculation.

In order to permit the evaluation of business climate for investments in planted forests and native forests, the IAIF-BR was split in two indexes: IAIF-BR for planted forests (IAIF-FP) and

IAIF-BR for native forests (IAIF-FN).

The IAIF-FP ranking presents the States of São Paulo in the top with 55 points and Minas Gerais with 54 points ( Table 13 ). These States have the best conditions for investments in planted forests, due the good social and economic infrastructure, and forest resources.

Follow them are Paraná, Rio Grande do Sul, Bahia and Santa Catarina, States with favorable situation SUPRA and INTER sectorial and a well-developed forest culture. Some States considered as new frontiers to the forest plantation appears just after (Mato Grosso do Sul, Piauí, Pará, Tocantins and Mato Grosso).

Table 13 - IAIF-BR 2009 Ranking for Planted and Native forests

State		IAIF-BR Planted Forests
1	São Paulo (-)	55
2	Minas Gerais	54
3	Paraná (-----)	43
4	Rio Grande do Sul (-)	41
5	Bahia (-)	41
6	Santa Catarina	40
7	Mato Grosso do Sul (-)	39
8	Piauí (-----)	38
9	Pará (----)	38
10	Tocantins (-----)	38
11	Mato Grosso	38
12	Espírito Santo (-----)	38
13	Rio G. do Norte (-----)	37
14	Amazonas (-)	37
15	Goiás (-----)	36
16	Sergipe (-----)	36
17	Pernambuco (-----)	35
18	Maranhão (-)	35
19	Acre (-----)	35
20	Ceará	35
21	Distrito Federal (-)	35
22	Paraíba (-----)	34
23	Amapá (-----)	34
24	Alagoas (-----)	32
25	Roraima (-----)	31
26	Rondônia (-)	30
27	Rio de Janeiro	30

State		IAIF-BR Native Forests
1	São Paulo (-)	49
2	Minas Gerais	45
3	Amazonas (-)	42
4	Pará (----)	40
5	Rio Grande do Sul (-)	39
6	Bahia (-)	38
7	Tocantins (-----)	38
8	Espírito Santo (-----)	37
9	Rio G. do Norte (-----)	37
10	Mato Grosso do Sul (-)	37
11	Paraná (-----)	37
12	Piauí (-----)	37
13	Santa Catarina	36
14	Sergipe (-----)	36
15	Goiás (-----)	36
16	Acre (-----)	35
17	Maranhão (-)	35
18	Pernambuco (-----)	35
19	Ceará	34
20	Paraíba (-----)	34
21	Amapá (-----)	34
22	Mato Grosso	34
23	Distrito Federal (-)	34
24	Alagoas (-----)	32
25	Roraima (-----)	31
26	Rondônia (-)	30
27	Rio de Janeiro	29

(-) Each symbol ‘-’ is equivalent to the quantity of average data used to the IAIF-FP and IAIF-FN calculation.

In terms of native forests, São Paulo leads the ranking of the more attractive States for investments with 49 points ( Table 13 ). This derives from the SUPRA and INTER sectorial good conditions, and strong policies to support forest producers. The State of Minas Gerais presents 45 points mainly derived from the good result in INTRA sectorial factors for native forests.

In the following, with 42 points, come Amazonas and Pará with 40 points this States have significant native forest potential, and if they had better conditions on SUPRA and INTER sectorial factors, they could be leaders in the ranking.

Among the last positions are the States of Roraima with 31 points and Rondônia with 30 points. These States are part of the called ‘Legal Amazon’ region and present significant results to the indicator ‘forest resource’, but they had their results affected by poor legal and institutional framework related to the forest activity.

Underlying these indexes (IAIF-FP and IAIF-FN), the IAIF-BR includes numerous subindexes that can be analyzed in some detail, thereby providing policy makers, entrepreneurs and investors with valuable information regarding forest investments opportunities evaluation and also orient the strategies for forest sector development policies in the Brazilian States.

The Forest Investment Attractive Index for Brazilian states is currently being updated using the most recent data available, but it is not published at the time this Guidebook was prepared.

## Forest Resources Development Procedure

This section presents principal issues related to the procedures for the development of forest resources, main forest plantations. For this, the section is divided in five parts. The first part discusses the principal public governance issues related to the forest sector, including the role of federal institutions.

Part two, complements the institutional framework explaining issues related to the participation of the civil society in the public management of forest resources.

Part three presents an explanation of the issues, institutions and rules involved in land acquisition, with a special discussion on the restrictions and procedures related to the acquisition of land by foreign individuals or companies. This part also provides information about land costs in different states and site conditions.

Part four describes some of the basic rules and restriction imposed by the law on landowners for the use of their rural properties.

Last, the fifth part presents the specific rules related to the planting of trees, specially the most commercially planted in the country and highly productive species of exotic trees.

### Public Governance of Forest Resources in Brazil

Forest governance in Brazil is decentralized at the three levels of government – federal, state and municipal. States and municipalities are important players in the management of forest resources and must respond to local priorities and engage local support needed to fulfill their mandates. Responsibility for issuing deforestation permits and the majority of instances of environmental licensing rests with state and local municipal agencies. (Government of Brazil, 2012)

At the federal level, there are several institutions that have responsibilities for forest related issues. Below, there is a brief description of the mandates of some of these institutions as it stands at the time of the preparation of this report.

The **Ministry of Environment (MMA)** is responsible for the following areas in relation to forest resources: I - national policy on the environment and water resources; II - policies on preservation, conservation and sustainable use of ecosystems, biodiversity and forests; III - strategies, mechanisms and economic/social instruments for improving environmental quality and the sustainable use of natural resources; IV - policies for balancing the environment and production; V - environmental policies and programs for the Legal Amazon, and VI - ecological and economic zoning. In order to perform its mandate, the MMA has various secretariats and specialist institutions:



1. **Secretariat of Climate Change and Environmental Quality (SMCQ)**, under the auspices of the MMA, is responsible for proposing policies and strategies related to the different types of pollution, environmental degradation and environmental hazards such as: waste harmful to health and the environment; environmental impact assessments and licensing; promotion of chemical safety; monitoring environmental quality; and, finally, the development of new instruments to improve environmental management and an environmentally sound energy matrix. The SMCQ is also responsible for designing strategies and policies on the mitigation of, and adaptation to, climate change and for coordinating the Executive Group of the Interministerial Committee on Climate Change. The Interministerial Committee and its Executive Group are in charge of the National Plan on Climate Change and the drafting and revision of the Sectoral Plans for Adaptation and Mitigation in several sectors and the national REDD+ strategy.
2. **Secretariat for Extractivism and Sustainable Rural Development (SEDR)** from MMA is responsible to promote sustainable development by proposing policies, strategies and studies in themes like land management; environmental management of coastal areas, agro extraction; productive chains for social and biodiversity products; restoration of rural degraded areas; sustainable biofuel production; aquiculture; environmental planning; forest recuperation policies; tourism environmental sustainability. SEDR also coordinates the Economic-Ecologic Zoning (ZEE), promotes the adoption of environmentally sound technologies in agriculture, extractivism, and its productive chains, and encourages the involvement of traditional communities, indigenous peoples and settlers in environmental planning and management. Furthermore it executes public policies regarding international environmental agreements ratified by the Government of Brazil.
3. **Brazilian Forest Service (SFB)** is a federal agency linked to MMA. It manages federal public forests for the sustainable production of goods and services. Its mission is to reconcile forest use and conservation, enhancing the value of forests to benefit the present and future generations through public forest management, knowledge building, capacity building and offering specialized services. It also has the responsibility of providing information in support of public and private sector decision-making, forestry training and fostering the forest sector. The SFB is also responsible for the National Forest Inventory (NFI) and National Forest Information System (NFIS). The Public Forest Management Commission (CGFLOP) is the advisory body of the Brazilian Forest Service. Its purpose is to advise, assess and propose guidelines for the management of public forests in Brazil and to contribute to the Annual Forests Concessions Plan.
4. **Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA)** is a federal agency linked to the MMA. Its main functions are the following: policing the environment; environmental licensing under the aegis of federal jurisdiction; control of environmental quality; authorizing the use of natural resources; zoning; environmental impact assessments; forest and environmental monitoring; levying administrative penalties; generation and dissemination of information and data on the environment; environmental monitoring, especially with regard to the prevention and control of deforestation, brush-burning and forest fires; and the establishment of criteria for managing the use of forest resources.



5. **Chico Mendes Institute for Biodiversity Conservation (ICMBio)** is a federal agency linked to the MMA. It is responsible for executing the actions required by the National Protected Areas System (SNUC). Its remit also covers proposing, implementing, managing, protecting, supervising and monitoring the federal sustainable use and integral protection Protected Areas (CUs).

The **Ministry of Agriculture, Livestock and Food Supply (MAPA)** is responsible for public policies aimed at boosting agriculture, agribusiness and promoting the regulation and standardization of services related to the agricultural sector. MAPA seeks to integrate marketing, technological, scientific, environmental and organizational aspects of the productive sector and supply sectors, storage and transport of crops and overseeing agribusiness-related economic and financial policy. By integrating sustainable development and competitiveness, MAPA aims to ensure that food is available for domestic as well as external consumption. Food production enhances the national productive sector and food exports increase Brazil's economic position in the global market.

MAPA also oversees the work of the Brazilian Agricultural Research Corporation (EMBRAPA) which is engaged in research, development and innovation with a view to finding solutions for sustainable agriculture (including natural and planted forests) for the benefit of Brazilian society. The government has recently indicated that it intends to give a greater role for MAPA in matters related to forest plantations (SAE, 2014). However, no concrete measures have been adopted until the time this report was prepared.

### **Social Participation in the Public Management of Natural Resources**

In addition to public hearings and consultations held in local communities in the specific situations foreshadowed by current legislation, the following two collegiate institutions enable social participation in decision-making processes related to the forest resources management:

1. The National Environment Council (CONAMA) is the consultative and deliberative council of the National Environmental System (SISNAMA). It is a collegiate body that represents federal, state and municipal environment agencies, the private business sector and civil society.
2. The National Forest Commission (CONAFLO) provides guidelines for implementing the actions of the National Forest Program (PNF) and is a useful vehicle for coordinating participation by various groups interested in developing public policies for the Brazilian forest sector.

## Land access

This section presents the rules for the acquisition of rural lands by foreigners as well as provides information of land markets and prices.

### Rules for acquisition of rural land by foreigners<sup>16</sup>

Foreigners may acquire real property in Brazil and no local partner is needed. However, there are some limitations and/or fees applicable for specific areas, such as marine land, islands, rural land and areas near Brazil's international borders.

Brazilians and foreigners have almost equal rights when it comes to leasing or acquiring real estate.

All properties must be registered with a private notary public (*Cartório de Registros Imobiliários*) located in the same jurisdiction as the property. The real estate registry is such that each property can only be registered at one registry, which stores its entire transaction history and physical identification. All information about a property is public and the registry costs vary depending on the state the property is purchased in.

In the case of rural properties, only foreigners with authorized permanent residence status in Brazil and an established residence (ownership of an urban property by the purchaser) may make an acquisition.

For purposes of rural land acquisition/leasing, the definition of a foreigner in Brazil is:

- Foreign individuals who are not naturalized, even if married to a Brazilian citizen with community property and with Brazilian children;
- Foreign corporations, that is, one whose capital is totally of foreign origin, headquartered abroad and authorized to operate in Brazil; and Brazilian corporations in which foreigners control the majority of the capital, whether they are individuals or corporations, residing or headquartered in Brazil or abroad.

Although foreigners are allowed to acquire land, there are some restrictions on the amount of land to be acquired which can be found in Table 14.

<sup>16</sup> Extracted from (Government of Brazil, 2014) with minor adjustments by the author.

**Table 14 - Land Size Restrictions for Foreigners**

NATURE OF FOREIGN PERSON	
Individuals	Corporations
Allowed to acquire up to 50 MEI <sup>17</sup> (Indefinite Exploitation Module), which is equivalent to areas ranging from 250 to 5,000 hectares, according to the MEI's value in each municipality.	Allowed to acquire up to 100 MEI, which is equivalent to areas ranging from 500 to 10,000 hectares, according to the MEI's value in each municipality

MUNICIPALITY AND NATIONALITY
The total sum of land areas acquired by foreigners in a municipality may not exceed 25% of its territory;
Foreigners of the same nationality cannot own more than 10% of the total area of a municipality.

For brief explanation of MEI, see footnote<sup>17</sup>.

Prior consent from the Executive Secretariat of the National Defense Council is necessary for real estate in a border territory or area deemed essential to national security.

The main requirements for the acquisition and leasing of land by foreigners in Brazil are found in Table 15.

**Table 15- Land Acquisition and Leasing Requirements for Foreigners**

INDIVIDUAL	CORPORATIONS
Being a permanent resident in Brazil and enrolled in the National Registry of Foreigners – RNE under permanent status;	Registration at the Board of Trade in the Brazilian State (Junta Comercial) where it is headquartered - in the case of a Brazilian corporation controlled by foreigners, whether they are natural or legal persons, residing or headquartered abroad;
Providing a use plan (only for areas above 20 MEI).	Official authorization to operate in Brazil, in the case of a foreign legal entity, that is, one in which foreigners control all capital;
	Clear provision in its bylaws regarding activities agriculture, livestock, forestry, tourism, industry or settlement activities;
	Providing a use plan, regardless of the size of the area to be acquired or leased.

<sup>17</sup> This is a unit of measure, expressed in hectares, used to establish the limit of acquisition and leasing of land by foreigners in Brazilian municipalities. The size of each MEI ranges from 5 to 100 hectares depending on the municipality. It is defined by the National Institute of Colonization and Agrarian Reform (INCRA) and takes into account the size, geographical location and economic activities of each municipality. The amount in hectares of each MEI can be found at [www.incra.gov.br/index.php/estrutura-fundiaria/regularizacao-fundiaria/aquisicao-de-terras-por-estrangeiros/file/1114-modulo-de-exploracao-indefinida-mei](http://www.incra.gov.br/index.php/estrutura-fundiaria/regularizacao-fundiaria/aquisicao-de-terras-por-estrangeiros/file/1114-modulo-de-exploracao-indefinida-mei) (Government of Brazil, 2014)

In the use plan mentioned above, the applicant for acquiring or leasing must specify the following information:

- Justification of proportionality between the amount of land to be acquired and size of the project;
- Physical and financial schedule for investment and implementation;
- Possible use of official credit to finance all or part of the venture;
- Logistical feasibility of its implementation and, in the case of an industrial project, demonstration of compatibility between the land location and the type of plant to be built;
- Demonstration of compliance with the criteria for Ecological and Economic Zoning of Brazil (ZEE<sup>18</sup>). The ZEE establishes which crops are best suited economically to each area of the country, taking into account measures and standards of environmental protection and biodiversity.

The use plan must be applied to the National Institute of Colonization and Agrarian Reform - INCRA, which, depending on the nature of the project, may send it to other government bodies, such as the Ministry of Development, Industry and Foreign Trade - MDIC; Ministry of Tourism – Mtur or Ministry of Agrarian Development – MDA to analyze; but, all projects must be assessed by the Ministry of Agriculture, Livestock and Food Supply - MAPA. Final authorization depends on INCRA's decision.

Considerations for an authorization request and presentation of a use plan are subject to the nature of the foreign person and the size of the property are found in Table 16.

**Table 16 - Considerations for Use Plan Presentation**

INDIVIDUALS	CORPORATIONS
<i>Land with an area equivalent of up to 3 MEI: the applicant must only declare it does not own another rural property in Brazil. Therefore, foreigners cannot acquire several properties with areas below 3 MEI each in order to be exempted from INCRA's authorization;</i>	<i>INCRA's authorization and a use plan are required regardless of the estate's size;</i>
<i>Land between 3 and 20 MEI: INCRA's authorization is required, but applicants are exempted from submitting a use plan;</i>	<i>For land measuring more than 100 MEI: besides INCRA's authorization and a use plan, an authorization from the Brazilian National Congress is also required.</i>
<i>Land measuring more than 20 MEI: INCRA's authorization and a use plan are required;</i>	
<i>Land measuring more than 50 MEI: besides INCRA's authorization and a use plan, an authorization by the Brazilian National Congress is also required.</i>	

<sup>18</sup> Find further information about ZEE on: [http://www.planalto.gov.br/ccivil\\_03/leis/L6938.htm](http://www.planalto.gov.br/ccivil_03/leis/L6938.htm)  
[http://www.planalto.gov.br/ccivil\\_03/DNN/2001/Dnn9465.htm#art11](http://www.planalto.gov.br/ccivil_03/DNN/2001/Dnn9465.htm#art11)  
[http://www.planalto.gov.br/ccivil\\_03/decreto/2002/d4297.htm](http://www.planalto.gov.br/ccivil_03/decreto/2002/d4297.htm)

Annex 12 includes a similar explanation provided by a different source which can help in the understanding of the rules for the acquisition of rural lands by foreigners.

### Land prices

Prices for land in Brazil vary substantially from state to state and within states. Besides the traditional determinants of land value, such as location near consumer centers and transportation and other public services availability, climate, soil fertility and other factors affecting growing conditions, there must be considered the existence of legal restrictions for use due to the physical nature of the areas involved.

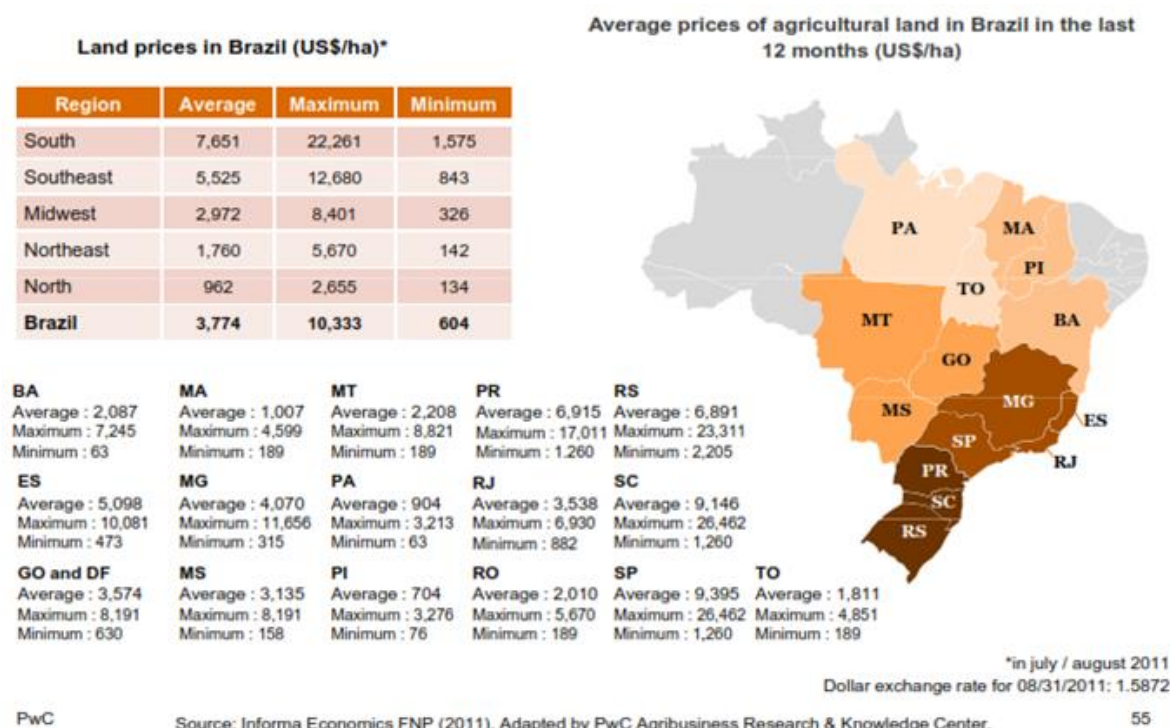
As Figure 15 shows, there is a tendency of prices to increase as one goes from the north to the south of the country. In 2011, prices varied from a minimum of US\$134.00 in the North to US\$22,261.00 in the South. Prices also vary within a given state.

These prices are researched for good agriculture productive equivalent lands in 133 regions of Brazil. Although forests are also planted on those lands, they do not reflect the prices generally expected for forest vocation lands which are not proper for agriculture production without major soil and water conservation investments.

This great range of possibilities highlights the need for careful selection of sites for purchase so as to fully estimate its commercial value and the importance of negotiation to arrive to a fair value for the land. Besides the understanding of the productive nature of the land for the use intended and market sought, the selection of properties require a full due diligence in regards to issues such as legal documentation and the level of compliance of the environmental, forest, fiscal, labor, and other regulations.

It should be noticed that land prices have been increasing substantially more than inflation. This increase has turned rural lands into a major investment asset which has traditionally given returns that improve substantially the financial feasibility of forest plantation investments.

**Figure 15 - Indicative Land Prices in Brazil - 2011.**



(PricewaterhouseCoopers , 2012)

## Rural Land Use Rules and Restrictions at Property Level

Private rural land properties are subject to rules that regulate and limit in part their use. These norms are established in an 84-article law recently enacted and which is commonly referred to as the New Forest Code (NFC) ([Law no. 12,651 of May 25<sup>th</sup> 2012](#)). Other regulations related to forest resources can be found at (IBAMA, 2014).

Although this law reaffirms several rules already in existence for many years, it does make substantial changes. The code covers issues such as natural vegetation protection, forest exploitation, forest as productive input, forest products origin control, forest fire prevention and control, identifies financial and economic instruments to help in obtaining its goals. Here, however, we provide a summary of the main rules as they apply to rural land owners, especially for the establishment and management of forest plantations with commercial exotic species.

Depending on the region of the country and original vegetation cover found in the property, the law requires that land owners set aside from 20% up to 80% of their property as **Legal Reserve** (RL). A Legal Reserve has the purpose of assuring the sustainable and economic use of the



property's natural resources, support the conservation and rehabilitation of ecological processes, to promote biodiversity conservation, as well as to shelter and protect wildlife and native flora.

The land owner has to keep the Legal Reserve covered with native vegetation. However, the land owner may request authorization from the state forest agency to sustainably manage the vegetation for economic purposes.

**Table 17 – Proportion of Legal Reserve of the Rural Property According with the Region and the Type of Original Vegetation**

Original Vegetation found in the property	Regions	
	Legal Amazonia*	All others
Forest	80%	20%
Savannah ( <i>Cerrado</i> )	35%	20%
General fields	20%	20%

Source: Art. 3º-III of the NFC. See Annex 1 for a map of the official Legal Amazonia.

In addition to RL, the NFC requires from landowners special management treatment for areas considered environmentally more vulnerable, the so called **Permanent Protection Areas (APP)**. These areas are considered protected, regardless of being covered by natural vegetation or not, because of their environmental function of preserving water resources, landscape, geological stability and biodiversity, facilitate gene flow of fauna and flora, soil protection and ensure the well-being of human populations. The APP are areas such as those along the borders of water bodies or on very steep slopes (above 45 degrees).

If the property has areas with slopes greater than 25 degrees, they can only be used for sustainable forestry uses, including natural forest management, plantations, and agroforestry, purposes. Wetlands and areas in the *Pantanal* region can only be used sustainably and any deforestation need to be authorized. These are the so called **Restricted Use Lands**.

The NCF also makes a distinction between deforested areas in the property that were cut before July 22, 2008 and those cut after that date. The first are named **Consolidated Rural Areas**. Exceptionally, The APP found in those consolidated areas are authorized to continue the activities--such as agroforestry, ecotourism, and rural tourism--that were undertaken on them up to that date.

To avoid sanctions, land owners have the alternative to request participation in a governmental **Program for Environmental Regularization (PRA)** of the APP that were illegally converted or used. Based on this request, the state forest agency asks the land owner to regularize the environmental situation of the property by signing a legally binding commitment document to restore the APP that are also Consolidated Rural Areas. After signing such document and while it is being properly executed, the land owner's fines, crime accusations, and sanctions that might have been issued by the authorities due to illegal land conversion prior to July 22, 2008 are suspended. After successful completion of the implementation of the restoration activities, the



suspended fines are converted to environment improvement services and these sites are considered legally regularized and all punishment is extinguished.

For deforested areas in the property that were cut after July 22, 2008 there is no possibility of regularization except by paying the fines and suffering the punishments issued by the justice system.

The conversion of any existing and remaining native forests that are not part of the RL or APP to other uses, such as a forest plantation, needs authorization from the state forest agency. To request this conversion authorization, the land owner has first to register the rural property in the **Rural Environmental Cadaster (CAR)**, in case it has not been done so yet. This conversion will not be authorized if the property has any other area not been used sustainably or is considered abandoned.

As a new requirement established by the 2012 NCF, all rural properties in the country have to be registered in the CAR. The cadaster is an electronic information system that has the purpose to allow the government in the monitoring, control, environmental and economic planning, and combat deforestation. In the map of the property prepared for registering in the CAR, the land owner has to identify the polygons of the RL, APP, the restricted use areas, the consolidated areas, as well as any the remaining natural forests.

### **Legal Requirements for Plantation Forests**

There is no requirement or license needed to plant forests with native or exotic species in legally suitable areas. However, State forest authorities must be informed of such plantations within one year of their establishment.

The maintenance and management of planted forests do not need any license or permission, except for the use of fire as a management practice which needs to be pre-approved by the State forest agency.

All land owners whose properties have planted or natural forests need to have a forest fire fighting contingency plan.

Planted forests located outside RL and APP do not need any permission or license to be harvested. Landowner, however, need to register the native species planted forest sites in a special cadaster maintained by the State forest authorities and report to these authorities any harvesting to be done.

Transportation of wood products from planted forests of exotic species is free of license or permission. However, planted forests with native species do need special permissions so that its origin can be differentiated from the native species wood that may come from illegal sources.

## General Environmental licensing

This section presents the institutions, norms, and procedures for the environmental licensing of activities that can potentially have negative environmental impacts. Several forest based production industries are required to have environmental licenses to be installed and operate.

It should be noted, however, that Environmental licensing is not required for planting forests.

The section is divided in two parts. The first presents the general institutions, legislation, and procedures for the environmental licensing. The second part present liability issues related to negative environmental impact of activities done by persons or firms.

### General Environmental Licensing Institutions, Legislation and Procedures<sup>19</sup>

An environmental license is an administrative tool in which the competent environmental agency (at the federal, state or municipal level) sets out environmental control conditions, restrictions and measures to be complied with by enterprises and their partners in setting up, expanding and operating enterprises or activities that use natural resources and can actually or potentially pollute the environment or cause environmental degradation in any way ( See Box 2 ).

IBAMA is the federal agency in charge of issuing an environmental license when an undertaking has a regional or national impact that causes undesired changes in the physical, chemical and biological characteristics of the environment. However, the state level environmental agency has the competence to grant environmental licenses to undertakings and activities implemented in more than one municipality or whose environmental impact goes beyond the territorial limits of one or more municipalities.

#### Box 2 - Environmental agencies and their roles

The following agencies, which together make up the National Environmental System – SISNAMA, are in charge of protecting the environment at federal level:  
 National Environmental Council – CONAMA: a normative, consultative and decision-making agency.  
 Ministry of Environment: in charge of coordinating, supervising and controlling the National Environmental Policy.  
 Brazilian Institute for the Environment and Renewable Natural Resources – IBAMA: federal executive agency in charge of inspecting corporate activities nationally.  
 Each state has its own environmental related agency (see Annex 13 for list) and all municipalities have the legal responsibility to manage their jurisdiction's environmental issues but most delegate it to state agencies for lack of institutional capabilities.

<sup>19</sup> This section was prepared based (Government of Brazil, 2014)

If an undertaking or activity has only a local environmental impact, that is, an impact restricted to municipal limits, it is up to the municipal agencies to grant an environmental license to it or not. Because of their weak administrative structure, some municipalities transfer the authority to grant environmental licenses to the state-level agency.

CONAMA's Resolution 237 of 1997 lists the activities and undertakings for which an environmental license is required. Here, only the forest related activities are mentioned:

- Lumber industry;
- Paper and cellulose industry;
- Rubber industry;
- Miscellaneous industries;
- Agricultural and cattle raising activities;
- Use of natural resources.

The administrative procedure to comply with the environmental legislation identifies the following sequence of environmental licenses:

1. **Pre-Licensing (LP):** License issued during the planning phase of an activity, setting out basic requirements to be met by a project in terms of location, establishment and operation based on rules for soil use, industrial zoning and city planning laws.
2. **Installation License (LI):** Document issued after the executive project of an undertaking is analyzed and documents are submitted to confirm that the requirements set out in the pre-licensing were met, that solutions were adopted to neutralize, mitigate or offset environmental impacts, and that environmental control procedures were established. This license authorizes the implementation of approved projects.
3. **Operational License (LO):** Document authorizing the start of the activities of an industrial enterprise or undertaking, after the correct operation of pollution control equipment is checked.

CONAMA may also require specific licenses according to the nature of the activity or undertaking, such as the following ones:

- Authorization for removal of vegetation;
- Authorization for use of Permanent Conservation Areas – APP;
- Concession for use of water resources;
- National historical and artistic heritage
- Indigenous populations and areas;
- General coordination of conservation units; and

## Environmental Guardianship and Liability<sup>20</sup>

Actions by citizens and companies that are harmful to the environment generate administrative, civil and criminal liability, as provided for in the Law on Environmental Crimes. All conduct causing damage must be compensated for, even when it is tolerated by legal standards, as is the case of emission of polluting wastes.

a) **Civil sanctions:** Civil liability for environmental damages is extra-contractual, objective and of a joint nature, according to the Federal Constitution (article 225), Law n. 6,938/81 (article 14) and the Civil Code (article 942).

- It is extra-contractual because it does not depend on any link between the parties;
- It is objective because it does not depend on the guilt of the agent; and
- It is of a joint nature because it can involve more than one person, whether natural or legal.

b) **Administrative sanctions:** Based on the duty of the Government to preserve the environment, whether by means of law enforcement powers (inspection) or by means of regulatory powers (creating and revoking laws and rules), various administrative measures can be adopted, such as officially recognizing public or private assets as heritage; requiring the submission of an environmental impact report; imposing restrictions and limitations on the right to build, among others.

When a violation is identified, a formal notice of environmental infraction is issued mentioning the legal rule that was violated and starting an administrative proceeding.

The Law on Environmental Crimes, regulated by Decree n. 3,179 of September 21, 1999, provides for administrative penalties applicable to conduct and activities that are harmful to the environment:

1. Warning;
2. One-time or daily fine of up to R\$ 50 million;
3. Seizing, destruction or suspension of the sale of the products used in the violation;
4. Prohibition, suspension or demolition of the illegal building or activities;
5. Obligation to pay compensation for damages;
6. Restriction of rights;
7. Suspension or cancelation of registration;
8. Denial of license, permit or authorization for irregular companies;
9. Loss, restriction or suspension of tax incentives and benefits, as well as of financing from official credit institutions; and

<sup>20</sup> Extrated from (MRE, 2012).

10. Prohibition to enter into contracts with the Public Administration for a period of 3 years.

c) **Penal sanctions:** Conduct and activities that are harmful to the environment subject violators, whether individuals or companies (with personal involvement of the partners, administrators, directors, council members, agents, proxies, managers or auditors) to criminal and administrative sanctions, in addition to the obligation to provide compensation for the damage caused.

Contractors are advised to specify the civil liability for material damages in their contracts with subcontracted companies, so as to hold them liable for any damaging conduct.

The Law on Environmental Crimes provides for environmental crimes and their respective sanctions. Individuals are subject to deprivation of freedom, penalties restricting rights and fines, while companies are subject to penalties restricting rights, fines and community service.

d) **Jurisdictional sanctions:** Through a public civil suit, provided for in Law n. 7,347 of 1985, it is possible to ensure protection to the environment by holding violators liable for damages caused to the environment and to property of artistic, aesthetic, historical, tourist and scenic value.

The Public Prosecutor's Office, the Public Defender's Office, the Federal Administration, States, Municipalities, Independent Government Agencies, Public Companies and Foundations and Non-Governmental Organizations (NGOs) are parties that can bring this kind of suit.

Section 6 of article 5 of Law n. 7,347/85, which governs public civil suits involving liability for environmental damages, provides that public agencies can sign a commitment with interested parties for adjusting their conduct in the light of legal requirements, establishing penalties under an extrajudicial executive document called Conduct Adjustment Commitment (*Termo de Ajustamento de Conduta* - TAC).

Violations of the environmental law can usually be negotiated with the Public Prosecutor's Office, the agency in charge of protecting the environment and applying criminal penalties in this area. However, certain conditions related to the seriousness of the violation must be considered for this purpose.

Other lawsuits may also be brought to protect the environment and ensure sustainable activities and projects, such as citizen lawsuits, individual or collective injunctions and direct unconstitutionality suits.

## Forest Resources Development (SWOT analysis)

In this section a SWOT (Strength, Weaknesses, Opportunities and Threats) analysis for Korean potential forestry investment companies and the countermeasures for threats are presented. The analysis assumes that the investment is for plantation forests to supply logs for the Brazilian domestic or the Korean markets. The analysis does not cover any industrial processing.

Table 18 presents a summary of the results of the SWOT analysis.

**Table 18 - SWOT Analysis for Korean Potential Forestry Investment Companies**

Internal issues	Strength	Weakness
	<ul style="list-style-type: none"> <li>• Korean market substantial demand for wood</li> <li>• Korean wood market knowledge and access</li> <li>• Financial resources</li> <li>• low cost funding available</li> </ul>	<ul style="list-style-type: none"> <li>• Portuguese Language is essential</li> <li>• Local partnerships not established</li> <li>• Lack of knowledge of country characteristics</li> <li>• Lack of knowledge of business conditions</li> <li>• Lack of knowledge of business rules</li> <li>• Local labor and staff inexistence</li> </ul>
External issues	Opportunities	Threats
	<ul style="list-style-type: none"> <li>• Brazilian domestic substantial market size and growth for biomass, charcoal, wood panels, cellulose</li> <li>• Export of wood products to satisfy Korean demand</li> <li>• Land availability</li> <li>• Excellent soil and climate conditions in many regions of the country</li> <li>• High forest productivity</li> <li>• Production systems well known and established</li> <li>• Short rotation periods</li> <li>• Production technology available</li> <li>• Eucalyptus clones with high productivity</li> <li>• Value chain well established</li> <li>• Trained labor and professionals</li> <li>• Low risk of natural disasters</li> <li>• Forest research networks continuously improving production systems</li> <li>• Relative low costs of planting</li> <li>• Availability of fiscal and other incentives</li> </ul>	<ul style="list-style-type: none"> <li>• Cross ocean transportation costs</li> <li>• In country transportation availability and cost</li> <li>• Varied infrastructure conditions</li> <li>• Tax complexity and high compliance cost</li> <li>• Land acquisition requires careful due diligence</li> <li>• Relatively high interest rate in Brazil</li> <li>• Varied business climate in states</li> <li>• Foreign land acquisition rules</li> <li>• Land use requirements and restrictions</li> <li>• Exchange rate volatility</li> <li>• High bureaucracy</li> </ul>

Source: Prepared by the author.

Table 19 presents countermeasure recommended to address the threats identified in the SWOT analysis.

**Table 19 - Countermeasures for Threats**

<b>Threats</b>	<b>Countermeasures</b>
Cross ocean transportation costs	Seek alternative plantation site locations in which access to ports with competitively price ocean transportation services
In country transportation availability and cost	Consider locations with appropriate road or rail transportation alternatives to port facilities or local major potential clients
Varied infrastructure conditions	Consider in the selection of sites the availability of sufficient other economic and social infrastructure services (such as health, education, communication, energy, etc.)
Tax complexity and high compliance cost	Negotiate with federal, state, and local authorities fiscal and infrastructure complementary incentives, benefits, investments to reduce installation and operational costs of plantations. Hire tax professional to identify best tax management alternatives for the operational phase of the business.
Land acquisition requires careful due diligence	Hire professional firm capable of undertaking legal, fiscal, labor, environmental and other relevant due diligence of land property alternatives. This should avoid unsecure land transactions and legacy liabilities transferred to new owners.
Relatively high interest rate in Brazil	Bring own financing from outside Brazil. In the country, seek credit opportunities that are subsidized by the government or equity investors.
Varied business climate in states	Identify important indicators to use to identify potentially more attractive states for the specific plantation project desired.
Foreign land acquisition rules	Hire professionals to help to identify best legal institutional solution or partnerships to overcome restrictions and comply with rules so as to have the greatest flexibility for site selection.
Land use requirements and restrictions	Site selection critical to assure maximum usable land and avoid environmental restriction to forest plantations land use. Hire firms that can help in the identification of properties which will have minimum legal restriction for the establishment of forest plantations besides their plantation aptitude.
Exchange rate volatility	Adopt conservative hedging strategies to mitigate eventual exchange rate volatility, if it is critical for business model
High bureaucracy	Seek local advisors to help overcome bureaucratic hurdles.

Source: Prepared by the author.



## Case Study of certain companies

This section presents several cases of successful and well established forest plantation related companies in Brazil. These companies cover a wide range of forest products, including pellets and chips for export, charcoal as an input into the steel production, fiberboards for the construction and furniture industries, and pulp and paper. Although no case of wood biomass based thermo electricity production firm is presented here, lately this type of business is getting increasing investments and attention by investors.

The information presented here gives a good overview of the nature of the major forest plantation businesses in the country.

A few of them are public companies with shares traded in the stock market so that their financial information is more readily available to the public. Other firms are private companies for which not much information about their business or financial issues are available to the public.

Links to sites of other forest companies in Brazil can be found in Annex 13.

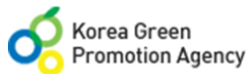
### **ArcelorMittal BioFlorestas**

Established in 1957, ArcelorMittal BioFlorestas is a company ruled by the values of quality, leadership and sustainability. It has 6 thousand hectares of permanent preservation, 33 thousand hectares of legal reserve and 95 thousand hectares of eucalyptus renewable forests. Using technology and innovation, today it is a reference in the Brazilian forest sector. Investing continually in research and innovation, the eucalyptus renewable forests in the areas of ArcelorMittal BioFlorestas are managed, adopting the highest quality standard. Its charcoal production in its energy production units has modern technology furnaces, high productivity mechanized processes to meet 100% of charcoal production of the plants of the ArcelorMittal Brasil Group.

Certified by FSC, OHSAS 18001:2007, ISO 14001:2004, it provides a safe, healthy and productive work environment, always promoting qualification and development to all of its collaborators. (AMS, 2013)

### **International Paper Company**

International Paper Company operates as a paper and packaging company with operations in North America, Europe, Latin America, Russia, Asia, and North Africa. Its Industrial Packaging segment manufactures container boards. Its products include linerboard, medium, whitetop, recycled



linerboard, recycled medium, and saturating kraft. The company's Printing Papers segment produces uncoated freesheet printing papers, including uncoated papers, market pulp, coated papers, and uncoated bristols. Its Consumer Packaging segment offers coated paperboard for various packaging and commercial printing end uses. The company's Distribution segment distributes products and services to various customer markets, supplying printing papers and graphic pre-press, printing presses, and post-press equipment for commercial printers; facility supplies for building services and away-from-home markets; and packaging supplies and equipment for manufacturers, as well as offers warehousing and delivery services. Its Forest Products segment owns and manages approximately 200,000 acres of forestlands and development properties primarily in the United States. The company was founded in 1898 and is based in Memphis, Tennessee. Source: <http://finance.yahoo.com/q/pr?s=IP+Profile> accessed on August 21th, 2010

In Brazil International Paper's production system is comprised of two pulp and paper mills in **Mogi Guaçu** and Luiz Antônio, and a paper mill in Três Lagoas. Together, the three mills produce paper for Brazil and export markets, in addition to products on the Chambril line for conversion and printing. The mill located in Mogi Guaçu, in São Paulo, is the first mill of IP within Brazil and has a production capacity of 440 tons of paper per year. Incorporated into the business portfolio of IP in 2007, the Luiz Antônio mill located near Ribeirão Preto, in São Paulo, is capable of producing annually 360 thousand tons of paper. In operation since 2009, the Três Lagoas mill in Mato Grosso do Sul state has automated finishing lines, capable of producing up to 140 reams of ChameX paper a minute, non-coated paper production capacity – 200,000 tons a year, and operates some of the most advanced technology on the market. It has had US\$ 300 million invested in it. The newest enterprise of IP in Brazil is the first factory to be built by International Paper out of the U.S..

International Paper owns 72,000 hectares of renewable eucalyptus forests used in pulp and paper production. It also has 24,000 hectares of preserved areas, to conserve the original characteristics of the native vegetation. These areas are distributed amongst Mogi Guaçu, Brotas and Luiz Antônio, municipalities in São Paulo State. The necessary care required to guarantee productivity in renewable forests includes research, studies and analysis to improve the eucalyptus species to develop new technologies. The company produces about 16 million cuttings a year which are used in eucalyptus planting. Fire prevention and eco-efficiency in forestry management are also constantly invested in by the company. IP has a Research Centre with laboratories and researchers in different areas, working together and developing more sustainable techniques and processes.

Contract forestry and Partnering: In addition to its own forests, International Paper gets raw material through fostering forests and partnering. In contract forestry, there are about 9,500 hectares in São Paulo and Minas Gerais States. The company supplies cuttings, technical assistance, forestry inventory, soil analysis, a map of the plantation, and recommends fertilizer to local producers. Later, the wood is sold to the company at market prices. So far, 122.7 million cuttings have been donated, grown, on 12,500 hectares of plantation. In its partnering, International paper takes responsibility for expenses in the implantation and maintenance of renewable forests. Later, these amounts are converted into wood for the company.

Source: <http://www.internationalpaper.com/BRAZIL/EN/index.html>



## FIBRIA

Fibria Celulose S.A. is engaged in the production, sale, and export of short fiber pulp. The company primarily offers bleached eucalyptus kraft pulp used in the manufacture of toilet paper; uncoated and coated paper for printing and writing; and coated cardboard for packaging. As of December 31, 2013, it had approximately 962 thousand hectares of reforested and protected areas in six Brazilian States. The company offers its products in Europe, North America, Asia, Brazil, and internationally. It has strategic alliance with Ensyn Corporation. The company was formerly known as Votorantim Celulose e Papel S.A. and changed its name to Fibria Celulose S.A. in November 2009. Fibria Celulose S.A. was founded in 1988 and is headquartered in São Paulo, Brazil. <http://finance.yahoo.com/q/pr?s=FBR+Profile>

FIBRIA's 2013 Management Report and financial results can be found at (FIBRIA, 2014)

## Eucatex

Eucatex S.A. Indústria e Comércio S.A. was founded in 1951 and since then it has been manufacturing and selling ceiling lining and insulating material produced from eucalyptus fiber. These are low-density products with thermal and acoustic insulation properties, which were broadly used in the Brazilian civil construction market. In the late 1960s and early 1970s, financial resources generated by its operations, from foundation, were invested in the implementation of production lines for hardboard (high-density wood fiber panels), which still, to date, is one of the flagships of the Company.

Currently, Eucatex is the second largest producer of wood fiber panels in the foreign market, with a market share of 45%. In 1996, Eucatex started to manufacture MDP panels and currently has a market share of 10% in this segment in Brazil. In addition, it is the domestic leader in ceiling lining and insulating materials, wall partitions, in addition to operating in the door and flooring markets.

Although Eucatex is traditionally known for its wood-related products, such as wood panels, MDP panels and correlated products, it also has a manufacturing line entirely integrated for the manufacturing of paint (for the Company's own consumption and to the market) and resins, expanded vermiculite-based products (used in the manufacturing of wall partitions and ceiling linings with thermal insulating properties) and peat, in addition to galvanized steel roofing sheets and steel profiles. The industrial evolution of Eucatex has always been associated to the growth of its planted forests, which ensures the continuous supply of an important raw material for the company, the eucalyptus wood.

In 2010, a new T-HDF/MDF line, installed at the Salto facility, started the production of high resistant and state-of-the-art panels and hardboards that have the mechanical resistance to manufacture flooring products, doors and wood wall partitions.

The Company mainly operates in the furniture and civil construction segments, and each of these industries represents 42% and 44% of its income, respectively.

<http://ri.eucatex.com.br/show.aspx?idCanal=672q0NaW6rkYETWg8S/fGg==>

The Eucatex forests cover an area of over 42,000 hectares, consisting of 32 farms located in the environs of the cities of Salto and Botucatu, in the countryside of the state of São Paulo, Brazil. One third of the total land, approximately 14,000 hectares, represents areas of natural reserves and presents two types of vegetation, namely, tropical semi-deciduous forest and dense ombrophilous forests. Areas planted with eucalyptus supply the Eucatex plants with over 1 million m<sup>3</sup> of wood every year, which is a significant quantity for ensuring a sustainable system.

Products manufactured by Eucatex are recognized and certified by the Forest Stewardship Council (FSC), an international entity that ensures that its products are manufactured in a responsible fashion, using wood produced under an economically viable, ecologically correct and socially fair management.

<http://ri.eucatex.com.br/show.aspx?idCanal=b9nniFQdpsY82aZtj8aFJg==>

## Stora Enso

Stora Enso is a Swedish-Finnish based global paper, packaging and wood products company producing newsprint and book paper, magazine paper, fine paper, consumer board, industrial packaging and wood products. The Group has some 27 000 employees and 88 production facilities in more than 35 countries worldwide, and is a publicly traded company listed in Helsinki and Stockholm. Its customers include publishers, printing houses and paper merchants, as well as the packaging, joinery and construction industries.

Stora Enso's annual production capacity is 12.7 million tonnes of paper and board, 1.5 billion square metres of corrugated packaging and 6.9 million cubic metres of sawn wood products, including 3.1 million cubic metres of value-added products. Its sales in 2009 were EUR 8.9 billion, with an operating profit excluding non-recurring items and fair valuations of EUR 320.5 million.

In Brazil, Stora Enso has invested in two mills and their respective forest plantations: Arapoti and Veracel. Source: Adapted from [www.storaenso.com](http://www.storaenso.com)

- **Arapoti Mill.** Located in the south of Brazil, in the state of Paraná, 1150 km from Brasília and 450 km from São Paulo city, Arapoti Mill is the only Light-Weight-Coated paper producer in South America. With its 360 employees, Arapoti has a total capacity of 180 000 tonnes per year, approximately 90% of which is sold in the domestic market. Two sources of fibre are used at Arapoti. A TMP plant produces pulp from Eucalyptus and Pine



trees that are grown on plantations near to the mill. The second source of fibre is kraft chemical pulp purchased mainly from Argentina and Europe.

- **Veracel.** The mill is the result of a partnership between two leaders in the pulp and paper industry, Brazilian Fibria and Stora Enso. The company is an integrated agro-industrial undertaking, operated by nearly 700 own employees and about 2,400 workers from specialized companies, ranging from eucalyptus planting to pulp final shipment. Veracel's mill is considered one of the world's most advanced in our sector, operating since 2005 to produced highly qualified pulp fiber. But the enterprise's commitment goes beyond the search for excellence in the final product. Respecting the environment, generating job and income to local communities, promoting improved life quality to the population, and generating development while following sustainability principles are the targets of Veracel. The company's forestry and industrial operations are certified by major assessment bodies for standards in compliance with the Brazilian Forestry Code, the laws protecting the Atlantic Forest, and the environmental law. Source: Adapted from [www.veracel.com.br/en/AboutVeracel.aspx](http://www.veracel.com.br/en/AboutVeracel.aspx)

## AMCEL

Amcel is a forestry company that operates in the State of Amapá since 1976 producing woodchips and biomass. In December 2006, was controlled by Japanese companies Marubeni Corporation and Nippon Paper Industries and later also by NYK - Nippon Yusen Kaisha. The annual production of woodchips is 900 thousand tons, which are processed and exported to Portugal, Spain, Italy, Turkey, Finland and Japan through the Port of Santana in the state of Amapá. Since its installation Amcel has invested about 240 million reais in forest infrastructure, such as nursery seedling production, planting, forest maintenance, machinery and equipment for sustainable forest development in the anthropic area of savannah and field. With an area of 60,000 hectares of eucalyptus already planted Amcel also plans to invest about 50 million reais by 2014 for the planting of ten to eleven thousand hectares per year, thereby realize their plans for 130,000 hectares of forests planted and become one of the leading companies in the forestry sector in northern Brazil. In this trajectory, the company is overcoming the difficulties and the adverse conditions of climate and soil testing around 3,000 different clones, in search of an ideal clone for fiber production to meet market needs. The Personal development, forestry technologies and quality operations are constant challenges in day-to-day business. With 100 million reais annual estimated sales employing approximately 1,000 direct jobs and another 3,000 indirect jobs, the company stands out as propulsive of State industrial and forest development, with forest bases in seven municipalities. Operations research and sustainable management of eucalyptus forests are certified by international standard ISO 14001 and FSC-Forest Stewardship Council, which confirms our commitment to sustainable practices, balancing the interests of ecological, social and economic issues. [http://www.amcel.com.br/us/todos\\_view.php?codigo=54](http://www.amcel.com.br/us/todos_view.php?codigo=54)

## Plantar (MG)

Established on February 1967, Plantar set a new concept for forest management, paving the way for the creation of a solid business group. The company was established with a focus on the forestry business, including the process going from the management of seedling nursery, planting and tree maintenance, to the complete formation of eucalyptus forests.

With headquarters in Belo Horizonte, Plantar Reflorestamentos, the company that originated the Group, is a reference in the Brazilian forestry sector. Through actions focused in planning, research and technology, it is able to perform all forestry activities, and its customers include pulp and paper, wood panels, iron and steel mills and pencil industries. Managing their own forests as well as others, the company now operates in seven Brazilian States.

With a vision for the future based on the sustainable development philosophy and using its large scale forests to produce charcoal, in 1985 Plantar Siderúrgica was established, a company which is vertically integrated in the pig iron production. Today, the company is a reference in terms of sustainability, due to its self-sufficiency in renewable charcoal from planted forests.

Plantar Group through Plantar Carbon Ambiental, was responsible for issuing the first forest carbon credits in the world, issued based on the Clean Development Mechanism, for which Plantar Carbon developed specific methodologies and technologies to reduce greenhouse gas emission.

Plantar Empreendimentos, another company of the group, operates in the segment of high quality preserved wood. With participation in various markets, such as construction, agribusiness, landscaping, furniture and interior decorating and design, the company has earned recognition for its product excellence, AMARU, and for its sustainably managed businesses.

We are proud of our investments which contribute directly to the promotion and improvement of the regional economies which we are a part of, creating jobs, developing technology, promoting knowledge, environmental awareness and social welfare.

<http://www.plantar.com.br/en/>

## Duratex

Duratex S.A., together with its subsidiaries, manufactures, exports, and sells wood panels, vitreous Chinaware, sanitary ceramics, metal products, and showers in Brazil. It operates through two divisions, Wood and Deca. The Wood division produces reconstituted wooden boards, including hardboard, medium density particle panels, laminated flooring, and medium, high, and super density fiberboard panels; agglomerate panels; ceiling and wall coverings; and components for the furniture industry under the Duratex, Duratree, Duraplac, MaDeFibra, and Durafloor brands. The Deca Division offers sanitary metal fitting, vitreous Chinaware, and related accessories under the Deca, Hydra, Belize, Elizabeth, and Thermosystem trademarks. The company has an area of



approximately 237 thousand hectares of planted forests and conservation areas in São Paulo, Minas Gerais, and Rio Grande do Sul. It also has operations in the United States and Europe. The company was founded in 1951 and is based in São Paulo, Brazil.

<http://finance.yahoo.com/q/pr?s=DTEX3.SA+Profile>

A fact sheet for Duratex including its latest financial results can be found at [http://www.duratex.com.br/ri/en/Download/1609\\_Fact\\_Sheet\\_1Q14.pdf](http://www.duratex.com.br/ri/en/Download/1609_Fact_Sheet_1Q14.pdf)

## **Masisa S.A**

Masisa S.A. engages in the production and trading of wood boards for furniture and interior architecture in Latin America. The company has pine tree and eucalyptus plantations spread all over Chile, Argentina, Brazil, and Venezuela. Business Units Board Business Unit: This unit markets wood boards in Latin America and its main products are MDF boards, particleboards, and melamine boards. It also markets other complementary products like sawn lumber, doors, and moldings. The Board Business Unit has an installed capacity of 2,383,000 cubic meters per year for the production of wood boards, and a capacity of 1,002,000 cubic meters per year for melamine and film coated boards. It also has a total capacity of 487,000 cubic meters of sawn lumber per year, which includes the remanufacturing processes, pre-painted MDF moldings, and manufacture of solid wood doors. Forestry Business Unit: The Forestry Business Unit manages equity of 238,000 hectares of plantations, mainly pine and eucalyptus, distributed in Chile, Brazil, Argentina, and Venezuela. It also has 59,000 hectares of natural forest reserve and protection areas.

<http://www.masisa.com/bra/>



## Conclusions and suggestions

Brazil offers many opportunities for foreign investors interested in forest plantation and associated businesses.

This can be shown, for instance, by the value of the forest production, the stock of commercial plantations in existence, their high productivity based on advanced technologies and production systems developed and adequate to various regions of the country, the contribution to exports revenues, the huge availability of suitable lands, the size of its domestic market, the competitiveness of forest plantation as compared to other countries, the availability of specialized professionals and labor, and the number of companies both domestic and foreign successfully operating in the country, and the creation of new and the expansions in industrial facilities and forest plantations that local and foreign investors are undertaking.

However, due to the diversity of conditions, legal requirements, and situations found in the country, investment project design, site selection, business model design, and efficiency in plantation establishment and management, are critical for the success of the plantation business.

This diversity represents challenges that have been overcome by many investors and can be overcome by new ones.

New investors in forest plantation in Brazil should carefully prepare their investments considering the following suggestions:

### General considerations:

- Clearly define forest plantation business model which will indicate the important issues to be considered in project design and implementation
- Identify important indicators to use to identify potentially more attractive states for the specific plantation project desired.

### Site location selection:

- Carefully select the tree species for the business purpose of the investment;
- Carefully identify and evaluate the suitability of sites for the selected tree species and business purpose
- If investment intends to export wood products, seek alternative plantation site locations in which access to ports with competitively price ocean transportation services
- Consider locations with appropriate road or rail transportation alternatives to port facilities or local major potential clients
- Consider the availability near the sites of sufficient other economic and social infrastructure services (such as health, education, communication, energy, etc.)



- Undertake legal, fiscal, labor, environmental and other relevant due diligence of land property alternatives. This should avoid unsecure land transactions and legacy liabilities transferred to new land owners.
- Assure maximum usable land and avoid environmental restriction to forest plantations land use. Hire firms that can help in the identification of properties which will have minimum legal restriction for the establishment of plantation forests.

Investment specific considerations:

- Negotiate with federal, state, and local authorities fiscal and infrastructure complementary incentives, benefits, investments to reduce installation and operational costs of plantations.
- Hire tax professional to identify best tax management alternatives for the operational phase of the business.
- Bring own financing from outside Brazil. In the country, seek credit opportunities that are subsidized by the government or equity investors.
- Hire professionals to help to identify best legal institutional solution or partnerships to overcome restrictions and comply with rules so as to have the greatest flexibility for site selection.
- Adopt conservative hedging strategies to mitigate eventual exchange rate volatility, if it is critical for business model
- Seek local advisors to help overcome bureaucratic hurdles.

Finally, foreigner may have a greater chance to assure success of their investors in forest plantations in Brazil if they establish partnerships with local investors and entrepreneurs who already operate successfully in the sector and have experience in taking advantage of opportunities and overcoming the hurdles commonly faced by foreigners.

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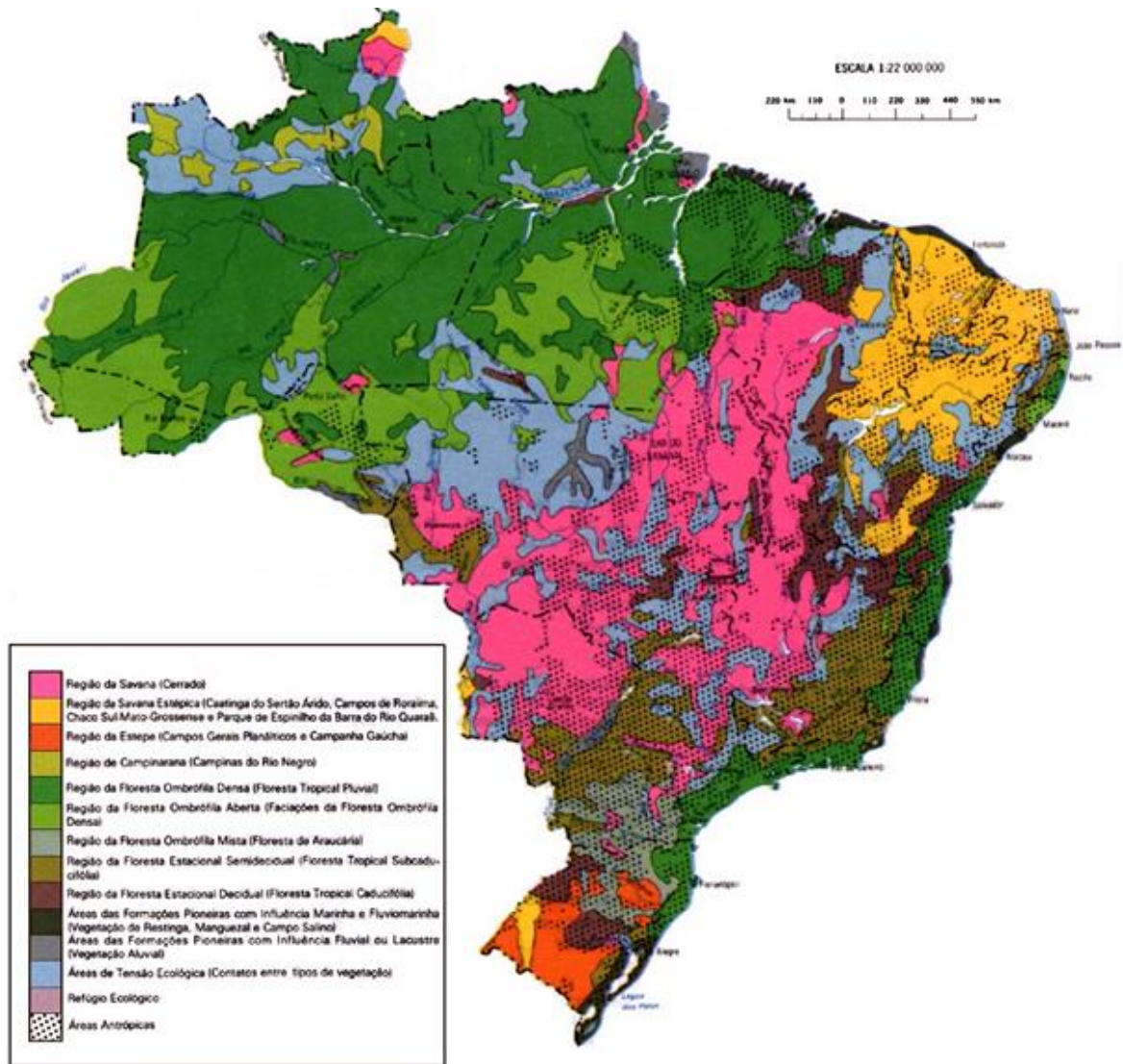
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## ANNEXES



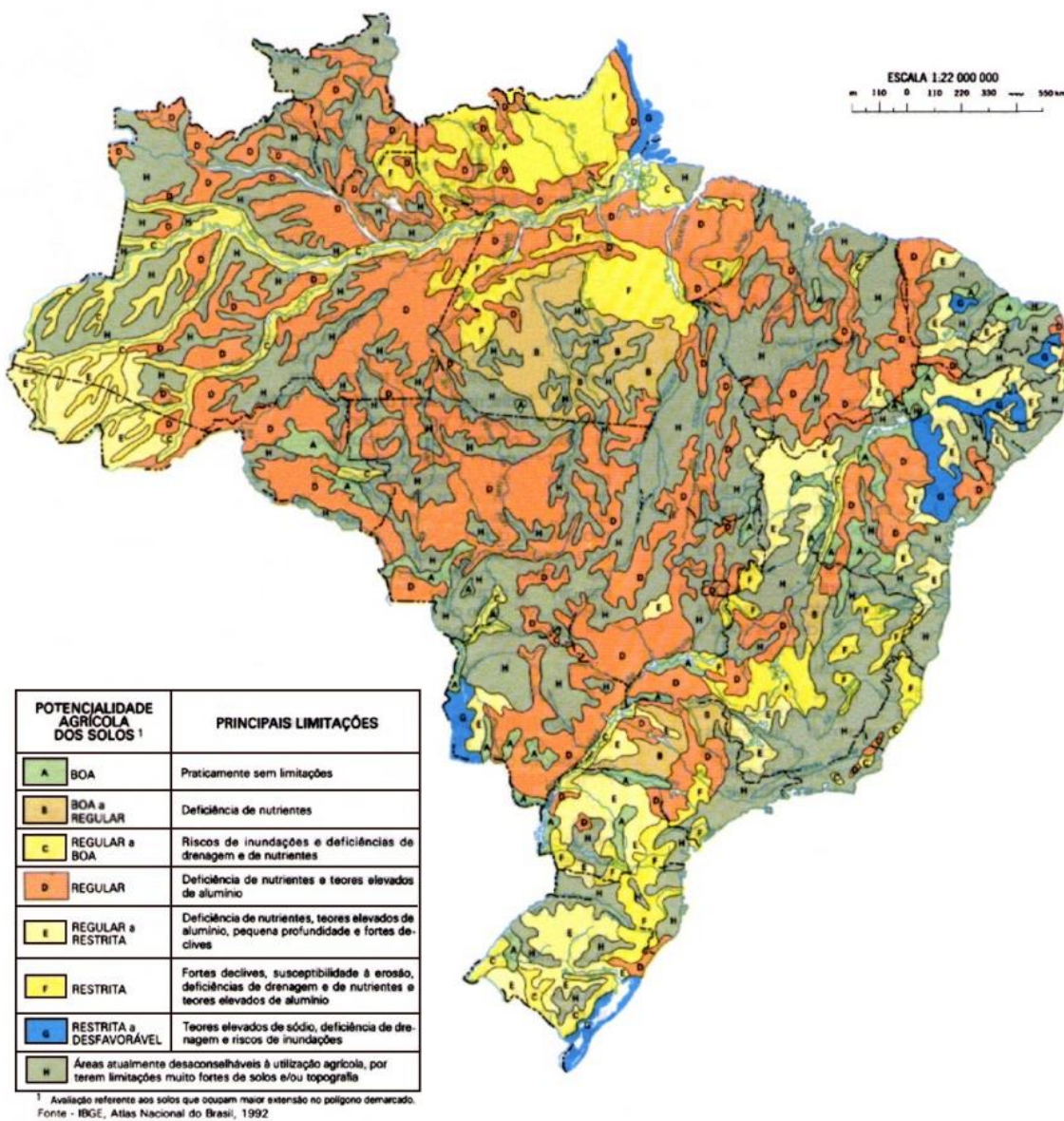
## Annex 1 – Maps



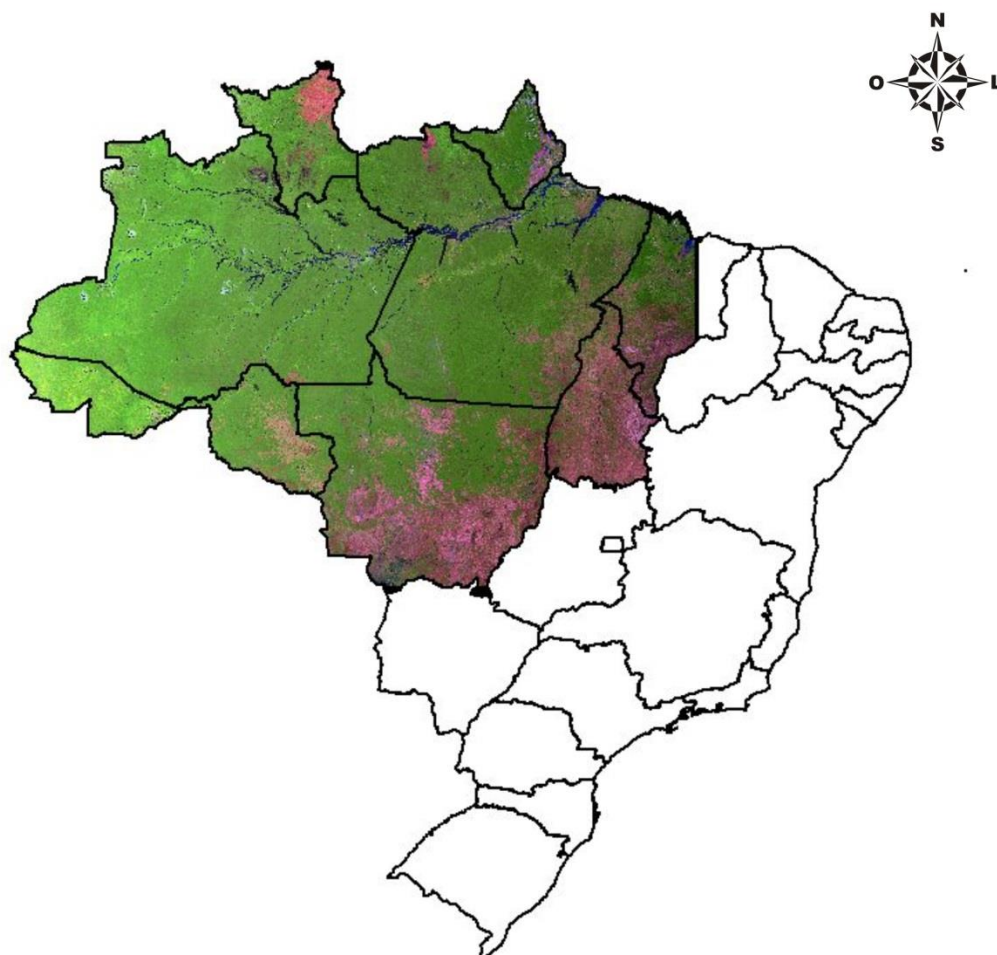
Map 1: Principal Biomes Found in Brazil

Source: Detailed map available (IBGE, 2014c). A description of Brazilian vegetation can be found here (IBGE, 2014d)

Mapa 1.19  
Potencialidade Agrícola dos Solos



Map 2 – Agriculture potential of soils. (IBGE, 2014L).



Map 3. Satellite Image Mosaic of Legal Amazonia Region





Map 4 – Minas Gerais State Road Map indicating forest sites ([Martim Campos](#) and [Sete Lagoas](#)) visited by the KGPA mission.

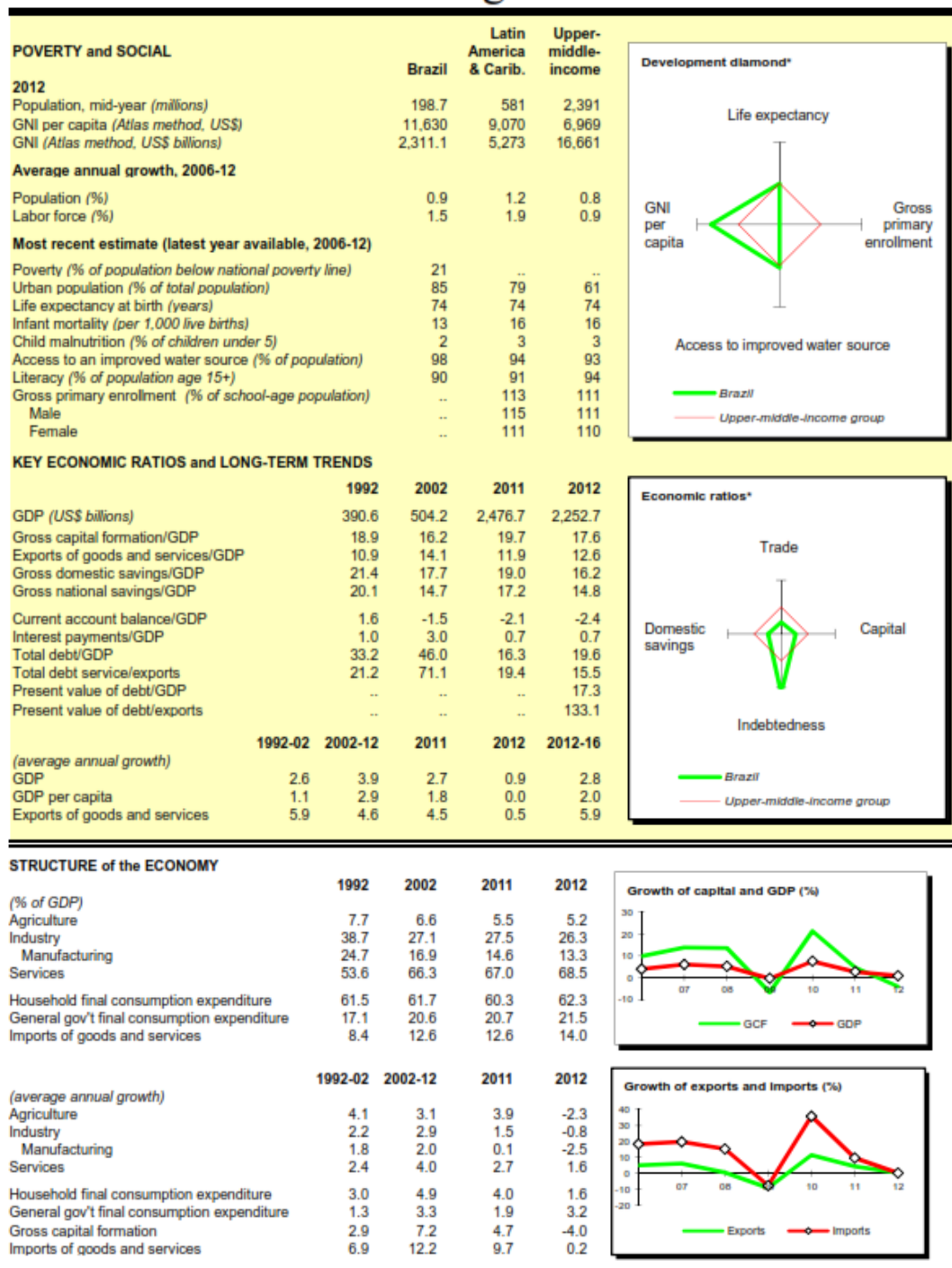


Map 5 – São Paulo State Road Map and indication of forest site ([Mogi Guaçu](#)) visited by the KGPA mission.

## Annex 2 - Brazil at a Glance

## Brazil at a glance

3/15/14



Note: This table was produced from the Development Economics LDB database.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.



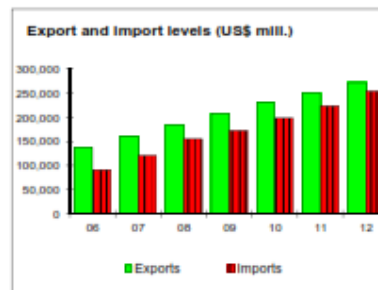
## PRICES and GOVERNMENT FINANCE

	1992	2002	2011	2012
<b>Domestic prices</b>				
(% change)				
Consumer prices	951.6	8.5	6.6	5.4
Implicit GDP deflator	968.2	10.6	7.0	5.3
<b>Government finance</b>				
(% of GDP, includes current grants)				
Current revenue	..	35.1	36.2	37.2
Current budget balance	..	-1.9	-0.1	-0.2
Overall surplus/deficit	..	-4.4	-2.6	-4.8



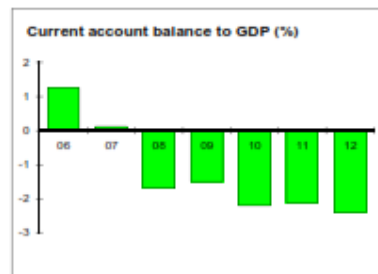
## TRADE

	1992	2002	2011	2012
(US\$ millions)				
Total exports (fob)	35,223	57,337	250,190	271,682
Coffee	2,534	3,049	20,731	20,532
Soybeans	2,696	3,032	15,014	16,146
Manufactures	23,787	33,000	140,002	154,433
Total imports (cif)	20,554	47,241	223,717	254,611
Food	850	1,085	3,098	3,284
Fuel and energy	3,069	6,240	29,057	30,744
Capital goods	6,335	11,643	50,486	59,959
Export price index (2000=100)	95	91	120	119
Import price index (2000=100)	53	77	97	96
Terms of trade (2000=100)	178	117	124	124



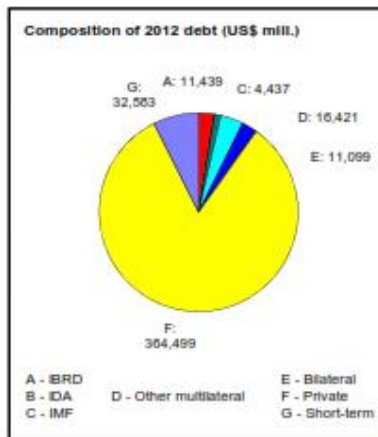
## BALANCE of PAYMENTS

	1992	2002	2011	2012
(US\$ millions)				
Exports of goods and services	39,873	69,913	294,249	282,443
Imports of goods and services	27,818	61,749	302,387	304,088
Resource balance	12,055	8,164	-8,138	-21,645
Net income	-8,152	-18,191	-47,319	-35,448
Net current transfers	2,206	2,390	2,984	2,846
Current account balance	6,109	-7,637	-52,473	-54,246
Financing items (net)	8,561	7,939	111,109	73,146
Changes in net reserves	-14,670	-302	-58,637	-18,900
<b>Memo:</b>				
Reserves including gold (US\$ millions)	23,265	37,832	352,010	373,161
Conversion rate (DEC, local/US\$)	1.64E-3	2.9	1.7	2.0



## EXTERNAL DEBT and RESOURCE FLOWS

	1992	2002	2011	2012
(US\$ millions)				
Total debt outstanding and disbursed	129,531	231,944	404,046	440,478
IBRD	7,238	8,585	9,034	11,439
IDA	0	0	0	0
Total debt service	8,708	52,047	59,069	45,483
IBRD	1,913	1,522	6,766	494
IDA	0	0	0	0
Composition of net resource flows				
Official grants	38	77	210	245
Official creditors	-957	633	-5,099	2,668
Private creditors	5,890	-8,339	74,780	46,345
Foreign direct investment (net inflows)	2,061	16,590	71,539	76,111
Portfolio equity (net inflows)	1,704	1,981	7,174	5,600
World Bank program				
Commitments	1,344	1,589	1,337	4,211
Disbursements	581	1,400	2,018	2,725
Principal repayments	1,266	1,063	6,571	316
Net flows	-685	338	-4,553	2,409
Interest payments	647	459	195	178
Net transfers	-1,332	-121	-4,749	2,231



Note: This table was produced from the Development Economics LDB database.

3/15/14

Source: (The World Bank, 2014)

### **Annex 3 - 2013 Investment Climate Statement- Brazil**

Adapted by the author from (US State Department, 2014)

Bureau of Economic, Energy and Business Affairs

February 2013

Source: US State Department, 2013

#### **Openness to, and Restrictions upon, Foreign Investment**

Brazil is open to and encourages foreign direct investment. New foreign direct investment (FDI) into Brazil reached approximately USD 65 billion in 2012 and, according to the United Nations Conference on Trade and Development (UNCTAD) World Investment Report, Brazil is the fifth-most attractive country for FDI for the period of 2012-2014 and is consistently the largest FDI recipient in Latin America, typically receiving close to half of all South America's incoming FDI. The United States is a major foreign investor in Brazil; according to the Central Bank of Brazil, the United States had the highest stock of FDI in Brazil as of 2010, with US\$104 billion. While Brazil is generally considered a friendly environment for foreign investment, complex tax and regulatory requirements exist. In most cases, these impediments apply without discrimination to both foreign and domestic firms. The Government of Brazil (GOB) generally makes no distinction between foreign and national capital in cases of direct investment.

#### **Ownership Restrictions**

FDI is prevalent across Brazil's economy, although certain sectors are subject to foreign ownership limitations. A 1995 constitutional amendment terminated the distinction between foreign and local capital in general, but there are laws that restrict foreign ownership within some sectors, notably aviation, insurance, and media.

#### **Conversion and Transfer Policies**

There are few restrictions on converting or transferring funds associated with a foreign investment in Brazil. Foreign investors may freely convert Brazilian currency in the unified foreign exchange market wherein buy-sell rates are determined by market forces. All foreign exchange transactions, including identifying data, must be reported to the Central Bank. Foreign exchange transactions on the current account have been fully liberalized.

Foreigners investing in Brazil must register their investment with the Central Bank within 30 days of the inflow of resources to Brazil. Registration is done electronically. Investments involving royalties and technology transfer must be registered with Brazil's patent office, the National Institute of Industrial Property (INPI). Investors must also have a local representative in Brazil. Portfolio investors must have a Brazilian financial administrator and register with the Brazilian Securities Exchange Commission (CVM).



All incoming foreign loans must be approved by the Central Bank. In most instances, the loans are automatically approved. Automatic approval is not issued when the costs of the loan are “not compatible with normal market conditions and practices.” In such instances, the Central Bank may request additional information regarding the transaction. Foreign loans obtained abroad do not require advance approval by the Central Bank, provided the recipient is not a government entity. Loans to government entities, however, require prior approval from the Brazilian Senate as well as from the Finance Ministry Treasury Secretariat, and must be registered with the Central Bank.

Interest and amortization payments specified in a loan contract can be made without additional approval from the Central Bank. Early payments can also be made without additional approvals, if the contract includes a provision for them. Otherwise, early payment requires notification to the Central Bank to ensure accurate records of Brazil’s stock of debt.

Foreign investors, upon registering their investment with the Central Bank, are able to remit dividends, capital (including capital gains), and, if applicable, royalties. Remittances must also be registered with the Central Bank. Dividends cannot exceed corporate profits. The remittance transaction may be carried out at any bank by documenting the source of the transaction (evidence of profit or sale of assets) and showing that applicable taxes have been paid.

Capital gain remittances are subject to a 15 percent income withholding tax, with the exception of the capital gains and interest payments on tax-exempt domestically issued Brazilian bonds. Repatriation of the initial investment is also exempt from income tax. Lease payments are assessed a 15 percent withholding tax. Remittances related to technology transfers are not subject to the tax on credit, foreign exchange, and insurance, although they are subject to a 15 percent withholding tax and an extra 10 percent Contribution of Intervention in the Economic Domain (CIDE).

The Government of Brazil imposes the IOF, a tax on financial operations, on portfolio capital inflows. The main goal of the tax is to discourage short-term, speculative capital flows that could lead to excessive currency volatility or significant appreciation pressures on the Brazilian currency. The GOB made several tweaks to the IOF over the course of 2012 based on changes in the size and pace of portfolio inflows into Brazil and developments in international financial markets. The IOF ended the year at 6.0 percent of all foreign loans with terms of 720 days or less used to fund operations in Brazil. Those with a longer maturity are exempt. Profits and FDI remittances must pay an IOF of 0.38 percent.

## **Expropriation and Compensation**

There have been no expropriation actions in Brazil against foreign interests in the recent past, nor have there been any signs that the current government is contemplating such actions. In the past, some claims regarding land expropriations by state agencies have been judged by courts in U.S.



citizens' favor. However, compensation has not always been paid as states have filed appeals to these decisions, and the Brazilian judicial system moves slowly.

## Dispute Settlement

The Brazilian court system, in general, is overburdened, and contract disputes can be lengthy and complex. The 2013 World Bank “Doing Business” survey found that on average it takes 44 procedures and 731 days to litigate a contract breach at an average cost of 16.5 percent of the claim.

Article 34 of Brazilian Law 9,307, the 1996 Brazilian Arbitration Act, defines a foreign arbitration judgment as any judgment rendered outside the national territory. The law established that the Brazilian Federal Supreme Court must ratify foreign arbitration awards. Law 9,307 also stipulates that the foreign arbitration award is to be recognized or executed in Brazil in conformity with the international agreements ratified by the country and, in their absence, with domestic law. (Note: A 2001 Federal Supreme Court ruling established that the 1996 Brazilian Arbitration Act, permitting international arbitration subject to Federal Supreme Court ratification of arbitration decisions, does not violate the Federal Constitution’s provision that “the law shall not exclude any injury or threat to a right from the consideration of the Judicial Power.”)

Brazil has ratified the 1975 Inter-American Convention on International Commercial Arbitration (Panama Convention), the 1979 Inter-American Convention on Extraterritorial Validity of Foreign Judgments and Arbitration Awards (Montevideo Convention) and the 1958 U.N. Convention on the Recognition and Enforcement of Foreign Arbitration Awards (New York Convention). Brazil, however, is not a member of the International Center for the Settlement of Investment Disputes (ICSID), also known as the Washington Convention.

Brazil has a commercial code that governs most aspects of commercial association, except for corporations formed for the provision of professional services, which are governed by the civil code. In 2005, bankruptcy legislation (Law 11101) went into effect creating a system, modeled on Chapter 11 of the U.S. bankruptcy code, which allows a company in financial trouble to negotiate a restructuring with its creditors outside of the courts. In the event a company does fail despite restructuring efforts, the reforms give creditors improved ability to recover their debts.

Brazil has both a federal and a state court system, and jurisprudence is based on civil law. Federal judges hear most disputes in which one of the parties is the State and rule on lawsuits between a foreign State or international organization and a municipality or a person residing in Brazil. Five regional federal courts hear appeals of federal judges’ decisions.

## Annex 4 - Economic Freedom of the World, 2013

## Brazil

	1980	1985	1990	1995	2000	2005	2010	2011
<b>Chain-Linked</b>	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)
Summary Rating Rank) >	<b>3.83</b> (89)	<b>3.28</b> (104)	<b>4.46</b> (93)	<b>4.72</b> (103)	<b>5.93</b> (89)	<b>6.27</b> (86)	<b>6.52</b> (84)	<b>6.56</b> (82)
<b>Area 1. Size of Government</b>	4.61 (68)	4.44 (72)	6.07 (44)	6.13 (60)	5.98 (71)	6.73 (58)	7.00 (39)	7.02 (38)
<b>Area 2. Legal System and Property Rights</b>	5.86 (34)	5.72 (42)	6.19 (36)	5.76 (59)	5.35 (74)	4.77 (83)	5.24 (77)	5.36 (75)
<b>Area 3. Sound Money</b>	0.00 (107)	0.00 (111)	0.00 (118)	0.00 (121)	6.14 (106)	7.64 (76)	7.97 (78)	8.20 (70)
<b>Area 4. Freedom to Trade Internationally</b>	1.36 (82)	1.13 (90)	5.14 (53)	6.83 (59)	6.67 (74)	7.13 (61)	7.13 (62)	7.10 (61)
<b>Area 5. Regulation</b>	5.16 (63)	4.58 (81)	4.74 (89)	4.99 (90)	5.53 (97)	5.05 (117)	5.23 (114)	5.10 (114)
<b>Unadjusted</b>	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)	Rating Rank)
Summary Ratings Rank) >	<b>4.18</b> (82)	<b>3.22</b> (105)	<b>4.18</b> (98)	<b>4.65</b> (104)	<b>5.93</b> (86)	<b>6.22</b> (100)	<b>6.47</b> (106)	<b>6.51</b> (102)
<b>Area 1. Size of Government</b>	<b>5.27</b>	<b>5.08</b>	<b>6.07</b>	<b>6.13</b>	<b>5.98</b>	<b>6.73</b>	<b>7.00</b>	<b>7.02</b>
A. Government consumption	8.34 (11.65)	7.93 (13.05)	4.55 (24.55)	4.51 (24.66)	4.44 (24.90)	4.43 (24.94)	4.15 (25.90)	4.26 (25.50)
B. Transfers and subsidies	6.76 (12.40)	7.41 (10.00)	7.22 (10.70)	6.52 (13.27)	5.96 (15.33)	8.98 (4.24)	7.86 (8.34)	7.82 (8.51)
C. Government enterprises and investment	2.00 (49.20)	4.00 (36.00)	7.00 (24.90)	8.00 (17.80)	8.00 (17.80)	8.00 (15.15)	8.00 (15.15)	8.00 (15.15)
D. Top marginal tax rate	4.00	1.00	5.50	5.50	5.50	5.50	8.00	8.00
(i) Top marginal income tax rate	4.00 (55)	1.00 (60)	9.00 (25)	8.00 (35)	8.00 (28)	8.00 (28)	8.00 (28)	8.00 (28)
(ii) Top marginal income and payroll tax rate			2.00 (53)	3.00 (60)	3.00 (50)	3.00 (50)	8.00 (28)	8.00 (28)
<b>Area 2. Legal System and Property Rights</b>	<b>5.86</b>	<b>5.72</b>	<b>6.19</b>	<b>5.76</b>	<b>5.35</b>	<b>4.69</b>	<b>5.16</b>	<b>5.28</b>
A. Judicial independence				5.55	5.51	3.03	4.56	4.58
B. Impartial courts				6.67	6.18	3.42	4.30	4.42
C. Protection of property rights				4.15	5.08	6.02	5.69	6.11
D. Military interference in rule of law and politics				5.45	6.67	6.67	6.67	6.67
E. Integrity of the legal system				6.96	3.33	4.17	3.33	3.33
F. Legal enforcement of contracts						4.82	4.00	4.00
G. Regulatory restrictions on sale of real property						8.19	8.51	8.50
H. Reliability of police						3.11	5.42	5.75
I. Business costs of crime						2.76	3.97	4.13
<b>Area 3. Sound Money</b>	<b>1.66</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>6.14</b>	<b>7.64</b>	<b>7.97</b>	<b>8.20</b>
A. Money growth	3.26 (33.71)	0.00 (111.36)	0.00 (458.38)	0.00 (479.01)	8.07 (9.63)	7.92 (10.39)	8.55 (7.27)	9.76 (1.19)
B. Standard deviation of inflation	3.37 (16.57)	0.00 (53.14)	0.00 (878.93)	0.00 (851.49)	7.88 (5.29)	9.02 (2.45)	9.33 (1.67)	9.38 (1.55)
C. Inflation: most recent year	0.00 (87.47)	0.00 (231.72)	0.00 (2509.47)	0.00 (77.59)	8.59 (7.04)	8.63 (6.87)	8.99 (5.04)	8.67 (6.64)
D. Freedom to own foreign currency bank accounts	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00
<b>Area 4. Freedom to Trade Internationally</b>	<b>3.24</b>	<b>0.94</b>	<b>4.28</b>	<b>6.49</b>	<b>6.67</b>	<b>7.16</b>	<b>7.16</b>	<b>7.12</b>
A. Tariffs	3.33	2.62	4.84	7.66	7.18	7.20	7.20	7.16
(i) Revenue from trade taxes (% of trade sector)	3.33 (10.00)	7.87 (3.20)	7.53 (3.70)	8.13 (2.81)	7.21 (4.18)	7.21 (4.18)	8.29 (2.57)	8.17 (2.75)
(ii) Mean tariff rate		0.00 (55.60)	4.00 (30.00)	7.60 (12.00)	7.12 (14.40)	7.54 (12.30)	7.26 (13.70)	7.26 (13.70)
(iii) Standard deviation of tariff rates		0.00 (26.20)	3.00 (17.50)	7.24 (6.90)	7.20 (7.00)	6.85 (7.87)	6.05 (9.86)	6.05 (9.86)
B. Regulatory trade barriers				5.27	5.34	6.14	6.48	6.43
(i) Non-tariff trade barriers				5.27	4.02	5.12	4.95	4.86
(ii) Compliance costs of importing and exporting					6.66	7.16	8.01	8.01
C. Black-market exchange rates	6.40	0.20	8.00	9.40	10.00	9.04	9.78	9.73
D. Controls of the movement of capital and people	0.00	0.00	0.00	3.64	4.17	6.26	5.18	5.16
(i) Foreign ownership/investment restrictions				7.29	7.56	6.16	5.99	5.94
(ii) Capital controls	0.00	0.00	0.00	0.00	0.77	6.15	3.08	3.08
(iii) Freedom of foreigners to visit						6.46	6.46	6.46



<b>Area 5. Regulation</b>	4.89	4.33	4.37	4.88	5.53	4.90	5.07	4.94
<b>A. Credit market regulations</b>	5.26	3.43	3.95	4.41	5.29	6.67	6.99	6.50
(i) Ownership of banks	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
(ii) Private sector credit	6.79	5.30	6.85	8.23	5.87	10.00	8.96	8.50
(iii) Interest rate controls/negative real interest rates	4.00	0.00	0.00	0.00	5.00	5.00	7.00	6.00
<b>B. Labor market regulations</b>			4.78	5.30	4.65	3.84	4.50	4.59
(i) Hiring regulations and minimum wage				6.67	3.46	2.20	2.23	2.23
(ii) Hiring and firing regulations			6.18	6.18	5.25	2.85	3.19	3.84
(iii) Centralized collective bargaining	5.18	5.18	5.18	5.18	5.52	5.25	5.46	5.36
(iv) Hours regulations				5.47	6.01	4.00	6.00	6.00
(v) Mandated cost of worker dismissal						5.74	7.13	7.13
(vi) Conscription	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
<b>C. Business regulations</b>				4.94	6.64	4.20	3.73	3.73
(i) Administrative requirements					7.70	1.46	1.74	1.70
(ii) Bureaucracy costs				5.61	7.38	5.26	4.39	4.39
(iii) Starting a business				5.95	5.73	6.56	6.61	6.62
(iv) Extra payments/bribes/favoritism				3.27	5.73	6.28	4.69	4.77
(v) Licensing restrictions						5.65	4.93	4.93
(vi) Cost of tax compliance						0.00	0.00	0.00

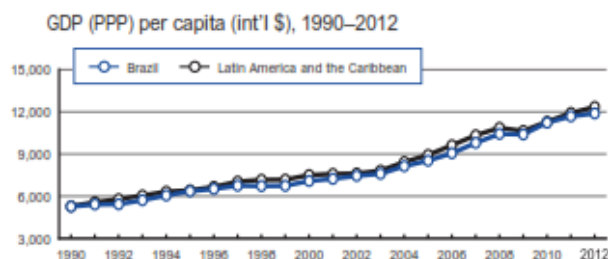
**Source:** (Gwartney, Lawson, & Hall, 2013)

## Annex 5 - World Economic Forum's Global Competitiveness index 2013

## Brazil

## Key indicators, 2012

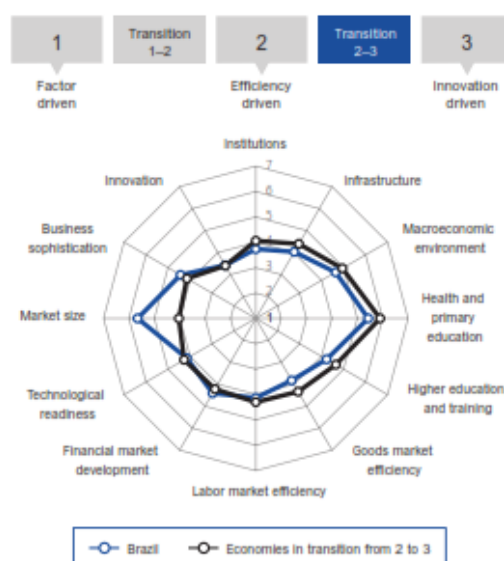
Population (millions).....	196.7
GDP (US\$ billions).....	2,396.0
GDP per capita (US\$).....	12,079
GDP (PPP) as share (%) of world total.....	2.83



## Global Competitiveness Index

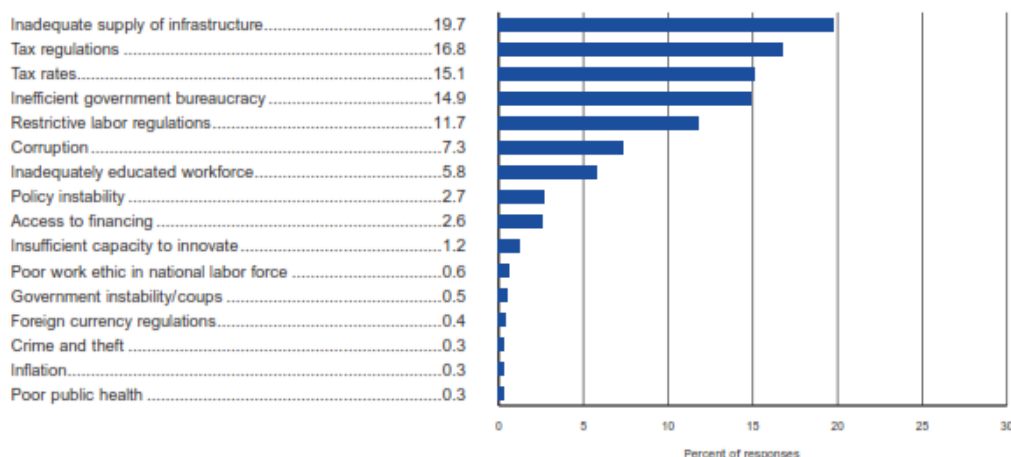
	Rank (out of 140)	Score (1–7)
GCI 2013–2014.....	56	4.3
GCI 2012–2013 (out of 144).....	48	4.4
GCI 2011–2012 (out of 142).....	53	4.3
Basic requirements (32.3%).....	79	4.5
Institutions.....	80	3.7
Infrastructure.....	71	4.0
Macroeconomic environment.....	75	4.6
Health and primary education.....	89	5.4
Efficiency enhancers (50.0%).....	44	4.4
Higher education and training.....	72	4.2
Goods market efficiency.....	123	3.8
Labor market efficiency.....	92	4.1
Financial market development.....	50	4.4
Technological readiness.....	55	4.1
Market size.....	9	5.7
Innovation and sophistication factors (17.7%).....	46	3.9
Business sophistication.....	39	4.4
Innovation.....	55	3.4

## Stage of development





## The most problematic factors for doing business



Note: From the list of factors above, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

## The Global Competitiveness Index in detail

INDICATOR	VALUE	RANK/145	INDICATOR	VALUE	RANK/145
<b>1st pillar: Institutions</b>			<b>6th pillar: Goods market efficiency (cont'd.)</b>		
1.01 Property rights	4.6	51	6.06 No. procedures to start a business*	13	135
1.02 Intellectual property protection	3.5	80	6.07 No. days to start a business*	119	144
1.03 Diversion of public funds	2.3	133	6.08 Agricultural policy costs	4.4	23
1.04 Public trust in politicians	1.9	136	6.09 Prevalence of trade barriers	3.9	116
1.05 Irregular payments and bribes	3.9	72	6.10 Trade tariffs, % duty*	11.3	126
1.06 Judicial independence	3.9	65	6.11 Prevalence of foreign ownership	4.5	84
1.07 Favoritism in decisions of government officials	2.9	89	6.12 Business impact of rules on FDI	4.3	97
1.08 Wastefulness of government spending	2.2	132	6.13 Burden of customs procedures	3.0	139
1.09 Burden of government regulation	2.0	147	6.14 Imports as a percentage of GDP*	13.0	145
1.10 Efficiency of legal framework in settling disputes	3.3	101	6.15 Degree of customer orientation	4.8	55
1.11 Efficiency of legal framework in challenging regs.	3.5	68	6.16 Buyer sophistication	3.6	55
1.12 Transparency of government policymaking	3.7	112	<b>7th pillar: Labor market efficiency</b>		
1.13 Business costs of terrorism	6.3	22	7.01 Cooperation in labor-employer relations	4.1	87
1.14 Business costs of crime and violence	3.4	124	7.02 Flexibility of wage determination	4.1	127
1.15 Organized crime	4.0	126	7.03 Hiring and firing practices	3.2	127
1.16 Reliability of police services	4.3	64	7.04 Redundancy costs, weeks of salary*	15.4	75
1.17 Ethical behavior of firms	3.7	87	7.05 Effect of taxation on incentives to work	2.5	135
1.18 Strength of auditing and reporting standards	5.3	31	7.06 Pay and productivity	3.6	99
1.19 Efficacy of corporate boards	4.8	44	7.07 Reliance on professional management	4.6	38
1.20 Protection of minority shareholders' interests	4.9	26	7.08 Country capacity to retain talent	4.1	38
1.21 Strength of investor protection, 0–10 (best)*	5.3	69	7.09 Country capacity to attract talent	3.7	53
<b>2nd pillar: Infrastructure</b>			7.10 Women in labor force, ratio to men*	0.76	86
2.01 Quality of overall infrastructure	3.4	114	<b>8th pillar: Financial market development</b>		
2.02 Quality of roads	2.8	120	8.01 Availability of financial services	5.3	30
2.03 Quality of railroad infrastructure	1.8	103	8.02 Affordability of financial services	4.5	45
2.04 Quality of port infrastructure	2.7	131	8.03 Financing through local equity market	3.5	45
2.05 Quality of air transport infrastructure	3.3	123	8.04 Ease of access to loans	2.9	64
2.06 Available airline seat km/week, millions*	3,780.6	9	8.05 Venture capital availability	2.7	61
2.07 Quality of electricity supply	4.8	76	8.06 Soundness of banks	6.3	12
2.08 Mobile telephone subscriptions/100 pop.*	125.2	45	8.07 Regulation of securities exchanges	5.8	7
2.09 Fixed telephone lines/100 pop.*	22.3	52	8.08 Legal rights index, 0–10 (best)*	3	115
<b>3rd pillar: Macroeconomic environment</b>			<b>9th pillar: Technological readiness</b>		
3.01 Government budget balance, % GDP*	-2.6	72	9.01 Availability of latest technologies	5.1	63
3.02 Gross national savings, % GDP*	15.4	93	9.02 Firm-level technology absorption	5.0	51
3.03 Inflation, annual % change*	5.4	98	9.03 FDI and technology transfer	5.1	25
3.04 General government debt, % GDP*	65.5	117	9.04 Individuals using internet, %*	49.8	65
3.05 Country credit rating, 0–100 (best)*	65.0	35			

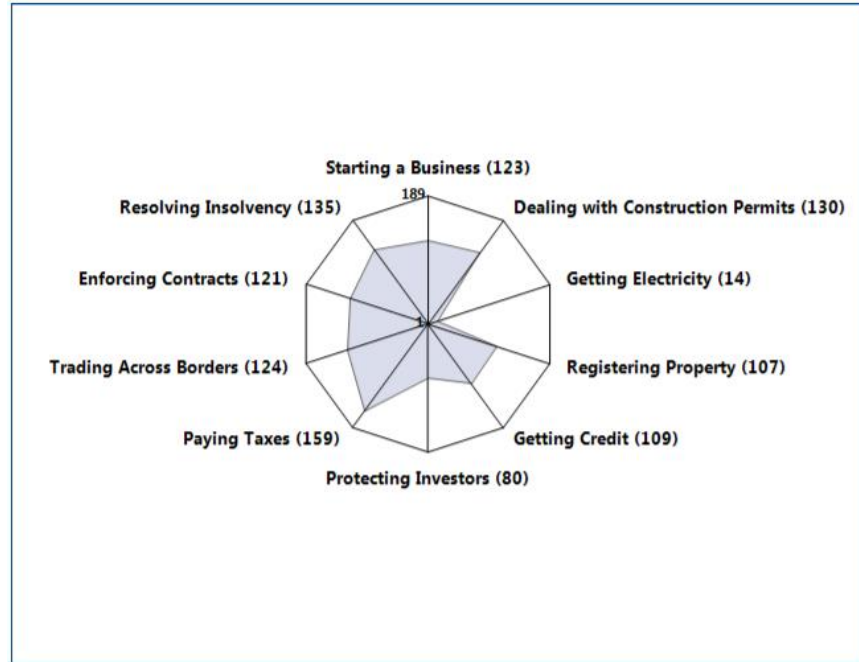
<b>4th pillar: Health and primary education</b>		9.05 Fixed broadband Internet subscriptions/100 pop.* ... 9.2 ..... 64
4.01 Business impact of malaria .....	6.2 ..... 82	9.06 Int'l Internet bandwidth, kb/s per user* ..... 25.1 ..... 61
4.02 Malaria cases/100,000 pop.* .....	219.6 ..... 107	9.07 Mobile broadband subscriptions/100 pop.* ..... 36.6 ..... 43
4.03 Business impact of tuberculosis .....	6.0 ..... 50	
4.04 Tuberculosis cases/100,000 pop.* .....	42.0 ..... 68	<b>10th pillar: Market size</b>
4.05 Business impact of HIV/AIDS .....	5.5 ..... 75	10.01 Domestic market size index, 1–7 (best)* ..... 5.7 ..... 7
4.06 HIV prevalence, % adult pop.* .....	0.30 ..... 60	10.02 Foreign market size index, 1–7 (best)* ..... 5.6 ..... 26
4.07 Infant mortality, deaths/1,000 live births* .....	13.9 ..... 74	10.03 GDP (PPP\$ billions)* ..... 2,355.6 ..... 7
4.08 Life expectancy, years* .....	73.4 ..... 78	10.04 Exports as a percentage of GDP* ..... 11.7 ..... 145
4.09 Quality of primary education .....	2.5 ..... 129	
4.10 Primary education enrollment, net %* .....	94.4 ..... 69	<b>11th pillar: Business sophistication</b>
<b>5th pillar: Higher education and training</b>		11.01 Local supplier quantity ..... 5.3 ..... 16
5.01 Secondary education enrollment, gross %* .....	105.6 ..... 20	11.02 Local supplier quality ..... 4.8 ..... 49
5.02 Tertiary education enrollment, gross %* .....	25.6 ..... 85	11.03 State of cluster development ..... 4.5 ..... 26
5.03 Quality of the educational system .....	3.0 ..... 121	11.04 Nature of competitive advantage ..... 3.0 ..... 108
5.04 Quality of math and science education .....	2.6 ..... 136	11.05 Value chain breadth ..... 3.7 ..... 68
5.05 Quality of management schools .....	4.5 ..... 49	11.06 Control of international distribution ..... 4.3 ..... 47
5.06 Internet access in schools .....	3.6 ..... 98	11.07 Production process sophistication ..... 4.5 ..... 35
5.07 Availability of research and training services .....	4.7 ..... 38	11.08 Extent of marketing ..... 5.1 ..... 29
5.08 Extent of staff training .....	4.3 ..... 44	11.09 Willingness to delegate authority ..... 4.3 ..... 34
<b>6th pillar: Goods market efficiency</b>		<b>12th pillar: Innovation</b>
6.01 Intensity of local competition .....	5.0 ..... 70	12.01 Capacity for innovation ..... 4.0 ..... 36
6.02 Extent of market dominance .....	4.4 ..... 28	12.02 Quality of scientific research institutions ..... 4.3 ..... 42
6.03 Effectiveness of anti-monopoly policy .....	4.5 ..... 40	12.03 Company spending on R&D ..... 3.6 ..... 37
6.04 Effect of taxation on incentives to invest .....	2.5 ..... 140	12.04 University-industry collaboration in R&D ..... 4.0 ..... 49
6.05 Total tax rate, % profits* .....	69.3 ..... 140	12.05 Gov't procurement of advanced tech products ..... 3.5 ..... 69
		12.06 Availability of scientists and engineers ..... 3.4 ..... 112
		12.07 PCT patents, applications/million pop.* ..... 2.9 ..... 51

Notes: Values are on a 1-to-7 scale unless otherwise annotated with an asterisk (\*). For further details and explanation, please refer to the section "How to Read the Country/Economy Profiles" on page 97.

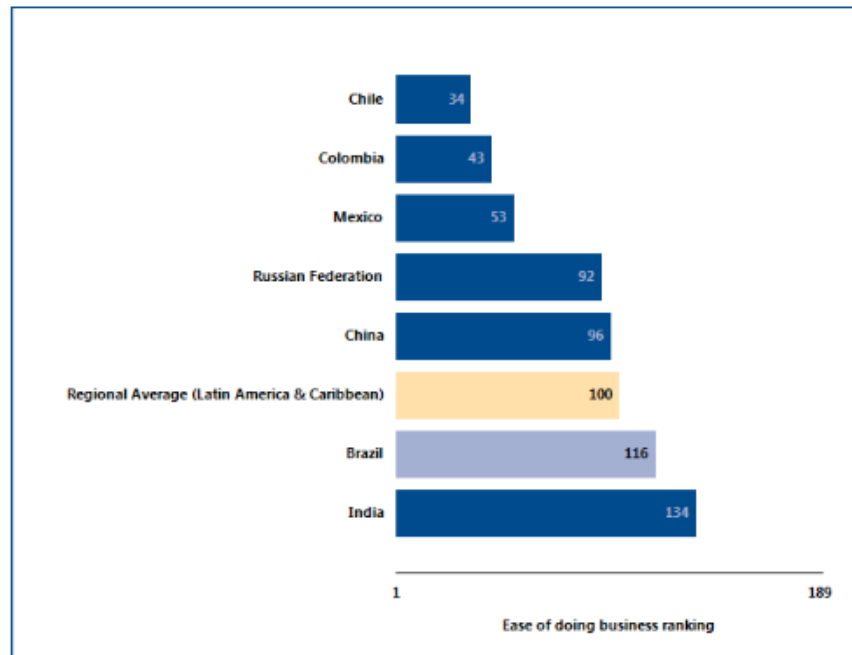
Source: (World Economic Forum, 2013)

## Annex 6 - Doing Business in Brazil 2014

### How Brazil Ranks On Doing Business Topics



### How Brazil and comparator economies rank on the ease of doing business



Source: (The World Bank, 2014b).

## Annex 7 - UNCTAD's Country Fact Sheet for Brazil - 2013

## Foreign direct investment (FDI) overview, selected years

(Millions of dollars and percentages)

FDI flows	2005-2007 (Pre-crisis annual average)	2009	2010	2011	2012	as a percentage of gross fixed capital formation			
						2005-2007 (Pre-crisis annual average)	2010	2011	2012
Brazil									
Inward	22 824	25 949	48 506	66 660	65 272	12.3	11.6	14.0	15.1
Outward	12 595	- 10 084	11 588	- 1 029	- 2 821	6.8	2.8	- 0.2	- 0.7
Memorandum									
Argentina									
Inward	5 759	4 017	7 848	9 882	12 551	11.3	9.6	9.8	12.3
Outward	1 751	712	965	1 488	1 089	3.4	1.2	1.5	1.1
Mexico									
Inward	25 374	16 561	21 372	21 504	12 659	12.9	10.5	9.3	5.2
Outward	6 830	8 464	15 045	12 139	25 597	3.5	7.4	5.2	10.5
South America									
Inward	53 064	56 719	92 134	129 423	144 402	13.9	12.2	15.1	16.8
Outward	20 639	3 920	30 948	27 993	21 533	5.6	4.1	3.3	2.5
Latin America and the Caribbean									
Inward	116 092	150 150	189 855	249 432	243 861	18.6	18.9	21.8	20.9
Outward	68 502	55 512	119 236	105 154	103 045	11.3	12.0	9.3	9.0
Developing economies									
Inward	452 023	530 289	637 063	735 212	702 826	13.3	10.2	10.1	9.0
Outward	238 224	273 401	413 220	422 067	426 082	7.1	6.7	5.9	5.5
World									
Inward	1 490 966	1 216 475	1 408 537	1 651 511	1 350 926	13.3	10.2	10.6	8.3
Outward	1 534 429	1 149 776	1 504 928	1 678 035	1 390 956	13.8	10.9	10.8	8.6
						as a percentage of gross domestic product			
FDI stocks	1995	2009	2010	2011	2012	1995	2010	2011	2012
Brazil									
Inward	47 887	400 808	682 346	695 103	702 208	6.2	31.8	28.1	31.2
Outward	44 474	164 523	188 637	202 586	232 848	5.8	8.8	8.2	10.3
Memorandum									
Argentina									
Inward	27 991	79 871	88 458	98 106	110 704	10.8	23.9	21.9	23.2
Outward	10 696	29 536	30 328	31 891	32 914	4.1	8.2	7.1	6.9
Mexico									
Inward	41 130	277 898	330 161	302 309	314 968	13.1	32.0	26.2	26.8
Outward	4 181	81 216	104 301	112 088	137 684	1.3	10.1	9.7	11.7
South America									
Inward	127 964	793 974	1 134 150	1 197 479	1 290 092	9.2	30.6	28.7	31.3
Outward	63 534	282 733	323 605	367 359	420 453	4.5	8.7	8.8	10.2
Latin America and the Caribbean									
Inward	187 086	1 514 471	1 983 509	2 118 301	2 310 630	10.4	39.7	37.7	41.2
Outward	88 346	760 990	898 145	1 015 387	1 150 092	5.0	18.2	18.3	20.7
Developing economies									
Inward	850 536	5 295 644	6 515 703	6 896 963	7 744 523	14.4	31.2	28.6	30.4
Outward	330 343	2 980 331	3 484 157	3 928 686	4 459 356	5.7	17.0	16.6	17.9
World									
Inward	3 441 326	18 311 537	20 380 267	20 873 498	22 812 680	11.5	32.1	29.8	32.2
Outward	3 791 296	19 518 956	21 130 046	21 441 873	23 592 739	12.7	33.6	30.9	33.6

Source: UNCTAD, World Investment Report 2013; <http://unctad.org/wir> or <http://unctad.org/fdistatistics>.

### Cross-border merger and acquisition overview, 2005-2007avg, 2010-2012

(Millions of dollars)

Region/economy	Sales (net)				Purchases (net)			
	2005-2007 (Pre-crisis annual average)	2010	2011	2012	2005-2007 (Pre-crisis annual average)	2010	2011	2012
Brazil	4 056	8 857	15 119	16 359	10 640	8 485	5 541	7 427
Memorandum								
Argentina	526	3 458	- 268	430	185	499	102	2 799
Mexico	2 497	7 990	1 231	330	8 004	2 892	4 274	5 830
South America	8 876	17 045	15 578	18 571	11 863	12 900	10 321	23 305
Latin America and the Caribbean	15 993	28 414	20 098	21 070	26 091	15 831	18 750	32 647
Developing economies	84 448	82 378	88 519	49 342	109 477	98 149	106 296	113 055
World	703 433	344 029	555 173	308 055	703 433	344 029	555 173	308 055

Source: UNCTAD, World Investment Report 2013; <http://unctad.org/wir> or <http://unctad.org/ditastatistics>.

### Greenfield investment project overview, 2005-2007avg, 2010-2012

(Millions of dollars)

Region/economy	As destination				As source			
	2005-2007 (Pre-crisis annual average)	2010	2011	2012	2005-2007 (Pre-crisis annual average)	2010	2011	2012
Brazil	22 801	44 010	62 950	26 373	3 578	10 413	4 613	3 186
Memorandum								
Argentina	4 738	7 112	12 000	6 004	531	1 284	905	1 369
Mexico	12 330	14 679	18 694	11 838	1 518	2 101	9 498	2 147
South America	50 328	92 510	104 518	50 010	10 512	18 692	10 517	6 555
Latin America and the Caribbean	70 783	120 116	138 531	65 728	12 817	21 736	20 773	9 074
Developing economies	496 069	544 258	559 722	346 088	210 706	238 178	252 483	197 806
World	852 482	901 152	913 828	612 155	852 482	901 152	913 828	612 155

Source: UNCTAD, World Investment Report 2013; <http://unctad.org/wir> or <http://unctad.org/ditastatistics>.

### Presence in the world's top 100 non-financial TNCs, ranked by foreign assets, 2012

(Millions of dollars and number of employees)

Corporation	Industry	Ranking by:		Foreign			TNI* (Per cent)
		Foreign assets	TNI*	Assets	Sales	Employment	
Vale SA	Mining & quarrying	61	89	45 721	38 326	15 680	47

Source: UNCTAD, World Investment Report 2013; <http://unctad.org/wir> or <http://unctad.org/ditastatistics>.

\* TNI, the Transnationality Index, is calculated as the average of the following three ratios: foreign assets to total assets, foreign sales to total sales and foreign employment to total employment.

### Presence in the top 100 non-financial TNCs from developing countries, ranked by foreign assets, 2011

(Millions of dollars and number of employees)

Corporation	Industry	Ranking by:		Foreign			TNI* (Per cent)
		Foreign assets	TNI*	Assets	Sales	Employment	
Vale SA	Mining & quarrying	4	63	48 045	49 475	17 522	47
Petroleo Brasileiro SA	Petroleum exploration & distrib.	18	97	19 604	13 184	8 033	8
Gerdau SA	Metal and metal products	29	55	15 415	12 075	19 304	53
JBS SA	Food, beverages and tobacco	54	51	8 754	28 019	76 132	55

Source: UNCTAD, World Investment Report 2013; <http://unctad.org/wir> or <http://unctad.org/ditastatistics>.

\* TNI, the Transnationality Index, is calculated as the average of the following three ratios: foreign assets to total assets, foreign sales to total sales and foreign employment to total employment.

Source: (UNCTAD, 2013)

## Annex 8 - Steeplands in selected Latin American and Caribbean countries (1,000 km<sup>2</sup>)

Country	Total area	Steep slopes 8 - 30 %		Very steep slopes > 30 %		Total steepland	
	Area	Area	%	Area	%	Area	%
El Salvador	21	11	53	6	28	17	81
Haiti	27	15	56	6	24	22	80
Honduras	112	59	53	28	25	88	78
Dominican Republic	47	25	53	9	19	34	71
Guatemala	108	52	48	23	22	76	70
Mexico	1,966	1,001	51	373	19	1,373	70
Peru	1,281	5	52	2	18	6	70
Jamaica	11	5	48	2	20	8	68
Panama	78	40	51	11	14	51	66
Trinidad and Tobago	5	2	44	1	22	3	66
Costa Rica	51	24	48	9	17	33	65
Chile	749	212	28	243	32	455	61
Venezuela	910	382	42	146	16	528	58
Nicaragua	144	59	41	19	13	78	54
Ecuador	283	89	31	60	21	149	53
Guyana	215	90	42	22	10	113	52
Belize	23	9	39	2	9	11	47
Colombia	1,136	412	36	119	10	531	47
Bolivia	1,096	253	23	175	16	428	39
<b>Brazil</b>	<b>8,479</b>	<b>2,938</b>	<b>35</b>	<b>293</b>	<b>3</b>	<b>3,230</b>	<b>38</b>
Argentina	2,772	481	17	283	10	763	28
Suriname	164	41	25	0	0	41	25
Paraguay	407	63	16	0	0	63	16
Uruguay	186	20	11	7	4	27	14

Source: (Nascimento, 2005)



**Annex 9 - Potential Equivalent Arable Land and Forest Vocation Land estimations for  
Selected Latin America and the Caribbean Countries (1,000 ha)**

	<b>COUNTRIES</b> (i)	<b>Total land</b> (V <sub>i</sub> )	<b>Pot. eq. arable</b> <b>lands (V<sub>ii</sub>)</b>	<b>Desert areas</b> (V <sub>iii</sub> )	<b>Arid areas</b> (V <sub>iv</sub> )	<b>FVL Potential</b>	
						<b>(I<sub>i</sub>)</b>	<b>(%) (I<sub>ii</sub>)</b>
1	Brazil	853,637	393,802	4,300	65,500	390,035	46
2	México (-)	196,062	36,471	65,700	94,100	11,163	58 (-)
3	Colombia	113,184	47,690	0	2,400	63,094	56
4	Peru	128,922	30,567	18,800	25,200	54,355	42
5	Venezuela	92,388	38,411	500	4,700	48,777	53
6	Argentina	277,685	71,161	55,000	117,500	34,024	12
7	Chile	75,202	2,003	23,100	17,800	32,299	43
8	Bolivia	108,903	46,067	10,800	24,900	27,136	25
9	Paraguay	39,905	1,257	0	6,100	20,548	51
10	Guyana	20,907	9,739	100	0	11,068	53
11	Ecuador	25,263	9,194	600	6,000	9,469	37
12	Honduras	11,490	2,162	0	0	9,328	81
13	Nicaragua	12,909	3,663	0	0	9,246	72
14	Bahamas (-)	13,940	nd	nd	nd	8,046	58 (-)
15	Surinam	14,429	6,736	0	0	7,693	53
16	Panama	7,569	1,584	0	0	5,985	79
17	Uruguay	17,907	12,522	0	0	5,385	30
18	Costa Rica	5,200	858	0	0	4,342	84
19	Dominican Rep.	4,879	1,418	0	0	3,461	71
20	El Salvador	2,015	573	0	0	1,442	72
21	Belize	2,063	709	0	0	1,354	66
22	Jamaica	1,132	108	0	0	1,024	90
23	Guatemala	11,045	2,821	0	0	8,224	74
24	Trinidad y Tobago	514	226	0	0	288	56
25	Barbados (-)	431	nd	nd	nd	249	58 (-)
26	Haiti	2,723	511	0	0	2,212	81

(-) Average data

(e) Estimated data;

$$I_i = V_i - V_{ii} - V_{iii} - V_{iv}$$

$$I_{ii} = I_i * 100 / V_i$$

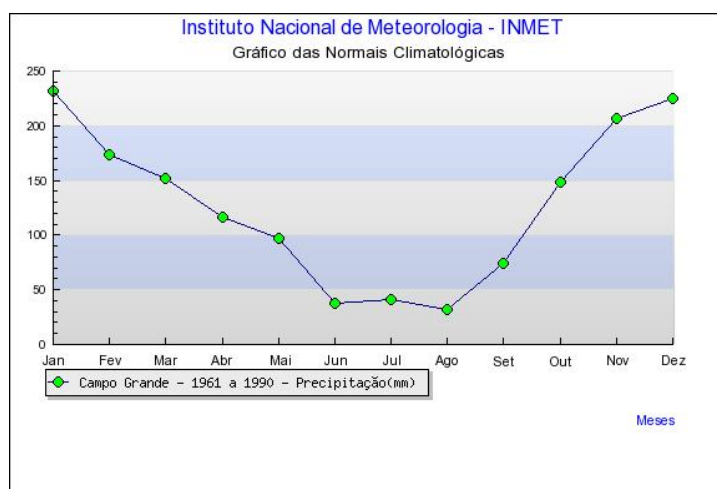
Source: FAO (2000); as prepared by STCP (2005) and modified by (Nascimento, 2005).



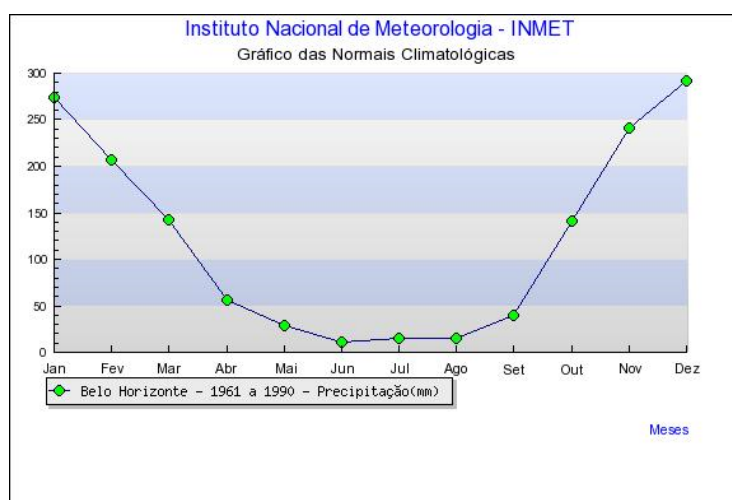
## Annex 10 - Monthly Rainfall for Selected States

In Brazil, the official measurements of Rainfall (and other climatic parameters) can be obtained at the link: <http://www.inmet.gov.br/html/clima/graficos/>

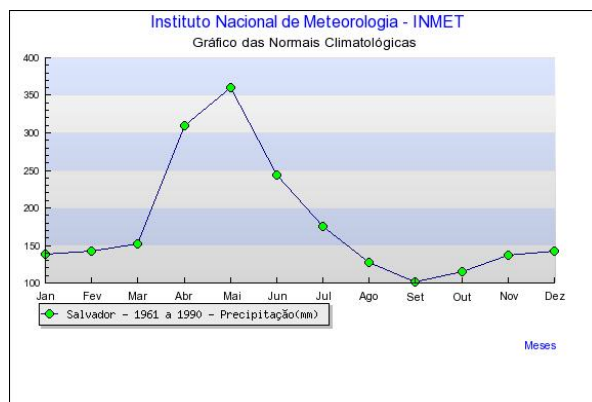
Below are presented the graphs of average precipitation for measuring stations located in favorable conditions for forest planting. The X axis represents the month while the Y axis represents the average precipitation in millimeters.



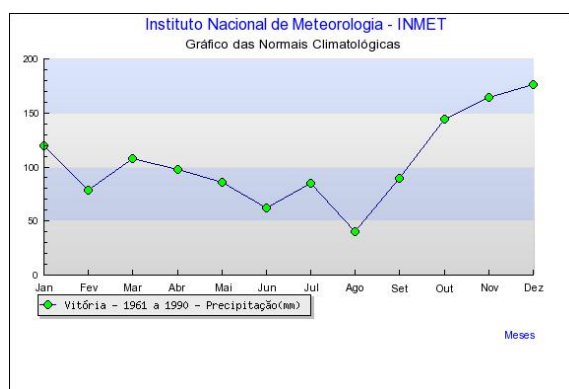
Graphic 1: Average Rainfall in Campo Grande (Mato Grosso do Sul State). 1961 to 1990.



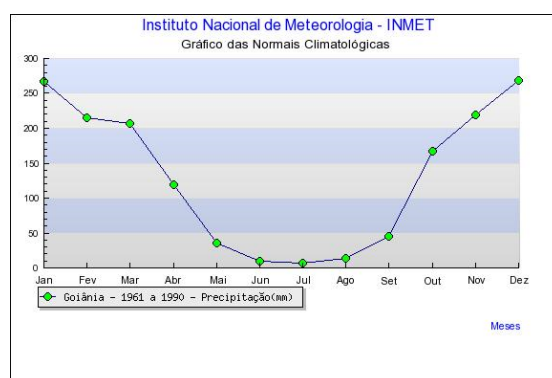
Graphic 2: Average Rainfall in Belo Horizonte (Minas Gerais State). 1961 to 1990.



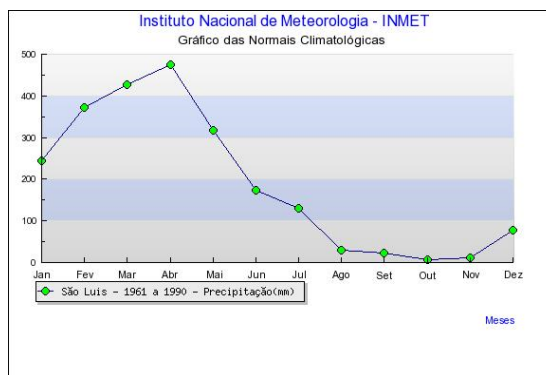
Graphic 3: Average Rainfall in Salvador (Bahia State). 1961 to 1990.



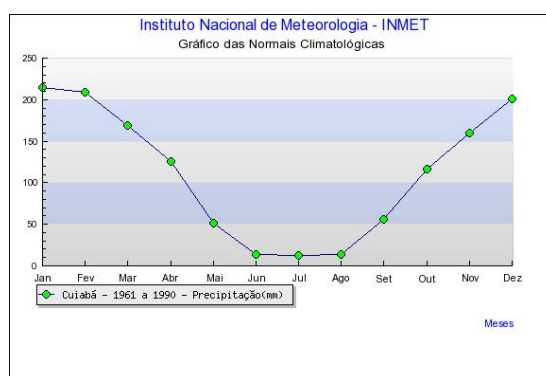
Graphic 4: Average Rainfall in Vitória (Espírito Santo State). 1961 to 1990.



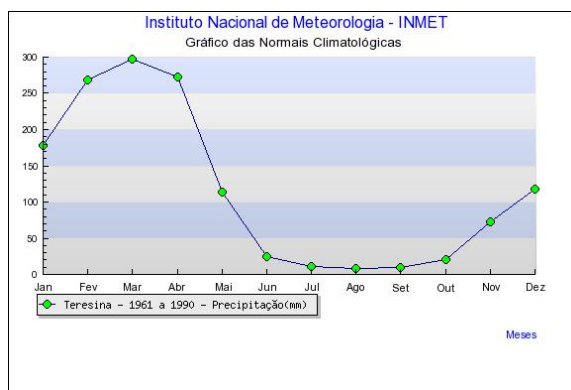
Graphic 5: Average Rainfall in Goiânia (Goiás State). 1961 to 1990.



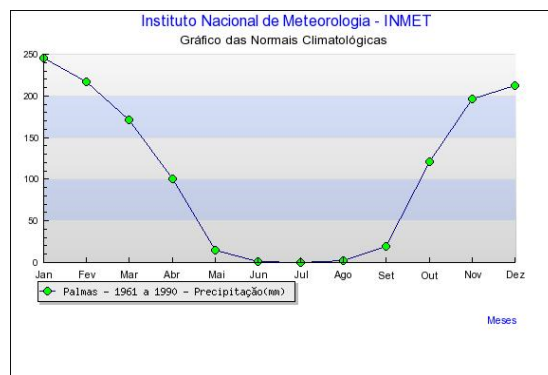
Graphic 6: Average Rainfall in São Luis (Maranhão State). 1961 to 1990.



Graphic 7: Average Rainfall in Cuibá (Mato Grosso State). 1961 to 1990.



Graphic 8: Average Rainfall in Teresina (Piauí State). 1961 to 1990.



Graphic 9: Average Rainfall in Palmas (Tocantins State). 1961 to 1990.

## Annex 11 - Forest Investment Attractiveness Index (IAIF) Results and Methodology <sup>21</sup>

What are and how can one measure the business climate factors that affect sustainable investments in the forest sector? What are the Latin American and Caribbean countries with the best and worse conditions for the success of such businesses? How to design strategies and action plans to improve this climate? These were the questions that guided the preparation by the Inter-American Development Bank of two instruments: the Forest Investment Attractiveness Index (IAIF) and the Process to Improve the Business Climate for Investment in the Forestry Sector (PROMECIF).

IAIF's purpose was to clarify governments and investors which are the factors that affect, lead to success, and attract private direct investment, domestic or foreign, to the forestry sector. The PROMECIF, in turn, helps adjust such factors to make a given country more attractive from the point of view of investors. The basic hypothesis underlining these instruments is that more direct investment in sustainable forest production chain activities contributes to increase production, productivity and competitiveness of the sector, generate employment and income, earn foreign exchange, fight poverty, and improve environmental conditions.

The IAIF seeks to measure countries' attraction for direct investment in sustainable forestry business. The IAIF allows: (i) to compare the performance of countries in the same year and the trend over time, (ii) to assist investors to pre-identify the countries where sustainable forest business will most likely be successful, and (iii) to clarify for countries which SUPRA, INTER and INTRA factors most affect their business climate for sustainable forestry investments.

The IAIF methodology considers 80 variables that make up a total of 20 indicators (several of them exclusive) that are integrated into a model that seeks to explain and predict levels of direct investment in the sector. The IAIF was applied to the IDB borrowing countries based on data from 2004 and 2006. The results achieved for 2006 and further details of IAIF's methodology are presented below in Table 3. In the case of countries with substantial sub national differences in socio-economic, institutional, or environmental features, a modified IAIF has been developed to measure the attractiveness of states or provinces.

The PROMECIF aims at helping countries design strategies and actions to improve their attractiveness to direct investment in sustainable forest businesses. The PROMECIF uses the IAIF model and results in a cyclical planning process with 3 phases. The PROMECIF methodology was applied to Nicaragua, Panama, Paraguay, and Ecuador.

### Detailed results of IAIF for Brazil

In terms of domestic market potential, Brazil is the leading country in the Southern Cone in terms population (190 million inhabitants), the largest in the Southern Cone, but not in terms of GDP per capita (US\$ 8,800), the second smallest.

As to forest potential, Brazil has an area of forest vocation land (3,927,000 Km<sup>2</sup>) almost ten times larger than that of Argentina, the country ranked second place in the Southern Cone.

In 2006, Brazil maintained the leading position in IAIF ranking (the same position as 2004). Tables 1 and 2 present the 2006 IAIF results, compared to the IAIF results in 2004.

<sup>21</sup> Adapted from Getulio Vargas Foundation and INCAE Business School. (2008) and (Nascimento & Tomaselli, 2007).

**Table 1: IAIF scores and ranks in 2004 and 2006**

	IAIF 2006	IAIF 2004	Difference
IAIF scores in 2004 and 2006	60	60	0
IAIF ranks in 2004 and 2006	1 <sup>st</sup>	1 <sup>st</sup>	↔

**Table 2: IAIF Results in Brazil**

	Rating in 2004	Rating in 2006	Max. rating possible	Potential growth in %
GDP Growth Rate	49	75	100	34
Passive Real Interest Rate	54	97	100	3
Exchange Rate Stability	35	100	100	0
Trade Openness	60	58	100	72
Political Risk	69	67	100	50
Tax Share of GDP	41	53	100	90
<b>SUPRA Sectorial Sub index</b>	51	75	100	34
Economic infrastructure	64	62	100	61
Social Infrastructure	78	79	100	26
Licenses and Permits	50	50	100	100
Labor	32	39	100	156
Capital Market	64	55	100	82
Property Rights	50	50	100	100
Capital Flow and Foreign Investment	50	50	100	100
Agricultural Policies	14	57	100	76
Planting and Harvesting Restrictions	16	52	100	91
<b>INTER Sectorial Sub index</b>	46	55	100	82
Forest Resources	49	40	95	138
Favorable Support	87	37	100	168
Domestic Market	85	95	100	5
FVL	80	80	100	25
Adverse Actions	45	42	100	137
<b>INTRA Sectorial Sub index</b>	69	59	99	68
<b>IAIF</b>	60	60	99	65

Even though the country maintained the leading position, the Brazilian IAIF remained stable (growing 0.1 points). Nevertheless, this result does not reflect the stability of factors involved in the SUPRA, INTER, and INTRA sub indexes. As a matter of fact, the substantial improvement seen in the SUPRA sub index, notably macroeconomic variables (GDP growth, interest rate reduction, and exchange rate stability), and INTER, notably the perception, by the forest sector players, of the agricultural policies and planting and harvesting restrictions, was offset by a decline in the factors involved in the INTRA sub index. Such result reflects basically the deterioration of the forest sector players' perception of decreased favorable support to forest businesses.

As to the SUPRA sub index-related factors, GDP Growth Rate, Passive Real Interest Rate, Exchange Rate Stability, and Tax Share of GDP improved. However, two of them declined: Trade Openness and Political Risk.

As to the INTER sub index-related factors, Economic Infrastructure, Social Infrastructure, Labor, Agricultural Policies and Planting and Harvesting Restrictions improved. Licenses and Permits, Property Rights, and Capital Flow and Foreign Investment remained unchanged. Capital Market was the only factor that declined.

In terms of the INTRA sub index-related factors, Forest Resources, Favorable Support and Adverse Actions declined. Domestic Market improved, and FVL remained unchanged.

Growth potential for the Brazilian IAIF is 65%, pointing to the existence of substantial room for implementing policies aimed at improving the attractiveness of forest investment.

Finally, it is worth noting that the estimated IAIF potential for Brazil (99) is the highest in Latin America and, as a result, in the Southern Cone.

IAIF Results for LAC Countries.

Table 3 - Overview of the IAIF scores results for 2006 and 2004 and evolution by country.

Country	IAIF 2006	IAIF 2004	Difference
Brazil	60	60	0
Chile	53	53	0
Argentina	47	44	+3
Uruguay	47	44	+3
México	44	40	+4
Panamá	44	37	+7
Colombia	44	40	+4
El Salvador	43	33	+10
Bolivia	41	34	+7
Peru	39	33	+6
Costa Rica	39	41	-2
Guatemala	38	30	+8
Haiti	36	23	+13
Nicaragua	36	34	+2
Trinidad y Tobago	36	33	+3
Suriname	36	34	+2
Venezuela	35	35	0
Belize	34	31	+3
Honduras	34	31	+3
Paraguay	33	31	+2
Ecuador	32	25	+7
Dominican Republic	32	32	0
Guyana	32	32	0
Average	40	36	+4
MIN	32	23	+9
MAX	60	60	0

#### Methodology

The IAIF was implemented for 23 borrowing member of the Inter-American Development Bank in Latin America and the Caribbean (Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Suriname, Trinidad y Tobago, Uruguay, and Venezuela). Figure 1 presents the IAIF geographic scope.





Figure 1: IAIF Geographic Scope



Most existing indexes are based on four different models of data aggregation listed below.

- a. Secondary data aggregation: consists in applying mathematical operations to secondary data from external sources (government, companies, research institutions, international agencies, etc.) in order to consolidate them into one index. It is probably the simplest and less expensive methodology;
- b. Aggregation of data collected by means of questionnaires (primary): used when it is necessary to measure concepts that are difficult or impossible to measure through secondary data;
- c. Combination of secondary data and data collected by questionnaires: in some cases, the methodology based exclusively on secondary data or on questionnaires does not render satisfactory results. A combination of the two methodologies can then be used.

d. Aggregation of indexes: The aggregation of indexes is used to measure abstract concepts, for instance, governability or corruption. This methodology has the power to combine several aggregate measurements in one index.

The IAIF design is based on a model that aggregates existing indexes, specific indicators and data revealed by the questionnaires (primary). The combination of existing indexes, developed by accredited institutions, and specific indicators based on primary and secondary information, to information collected by means of questionnaires allowed a significant cost reduction in the IAIF design, while maintaining its credibility.

The model is based on the hypothesis that the level of direct investment in sustainable forest businesses is directly and proportionally affected by the attractiveness level of investment to such businesses. Thus, the investment attractiveness level depends on the sustainable forest business profitability. That is, the more profitable a business is, the highest is its level of attractiveness.

On the other hand, the profitability of forest-industrial businesses is affected by a series of factors that can either limit or maximize its levels of revenue or costs. Knowing such factors and their importance to the forest-industrial businesses is crucial for potential investors.

Therefore, the IAIF index, through a mathematical model, incorporates the most relevant factors affecting forest-industrial enterprises, measures them and calculates a final score representing the business climate for investments sustainable forest businesses in any country of the world.

The IAIF Index is composed of three sub indexes, all of which analyze the forest sector investment attractiveness conditions in a specific country:

- a. SUPRA Sectorial Sub index: Refers to the macroeconomic factors and to other factors that affect the profitability of businesses in all productive sectors of a country;
- b. INTER Sectorial Sub index: Refers to the factors, generated in other economic sectors, that affect the profitability of forest-industrial businesses; and
- c. INTRA Sectorial Sub index: Refers to factors that are inherent to the forest sectors and that affect the profitability of forest-industrial businesses.

Besides facilitating the analysis of the level of attractiveness to direct investments in a specific country, this rating is highly useful for organizing factors according to the kind of players involved, and responsible for activities that might turn the business climate more favorable. At first, this approach will be oriented to the INTER sub index-related factors, in order to supply their demand, and to the INTRA sub index-related factors, over which the players have more action mechanisms. The SUPRA sub index-related factors cannot be easily changed by actions on the part of the forest sector players.

Based on the definition of the factors that make up the IAIF, we were able to identify indicators that were used for measurement. In general, especially for the SUPRA and INTER-related factors, we relied on indicators that have been used in existing indexes, once they adequately express the IAIF components. On the other hand, the factors that could not be measured by means of the existing indexes or indicators were obtained in the questionnaires.

Table 4 presents the list of the factors included in the IAIF index, as well as their corresponding indicators.

Table 4: Factors included in the IAIF index and corresponding indicators

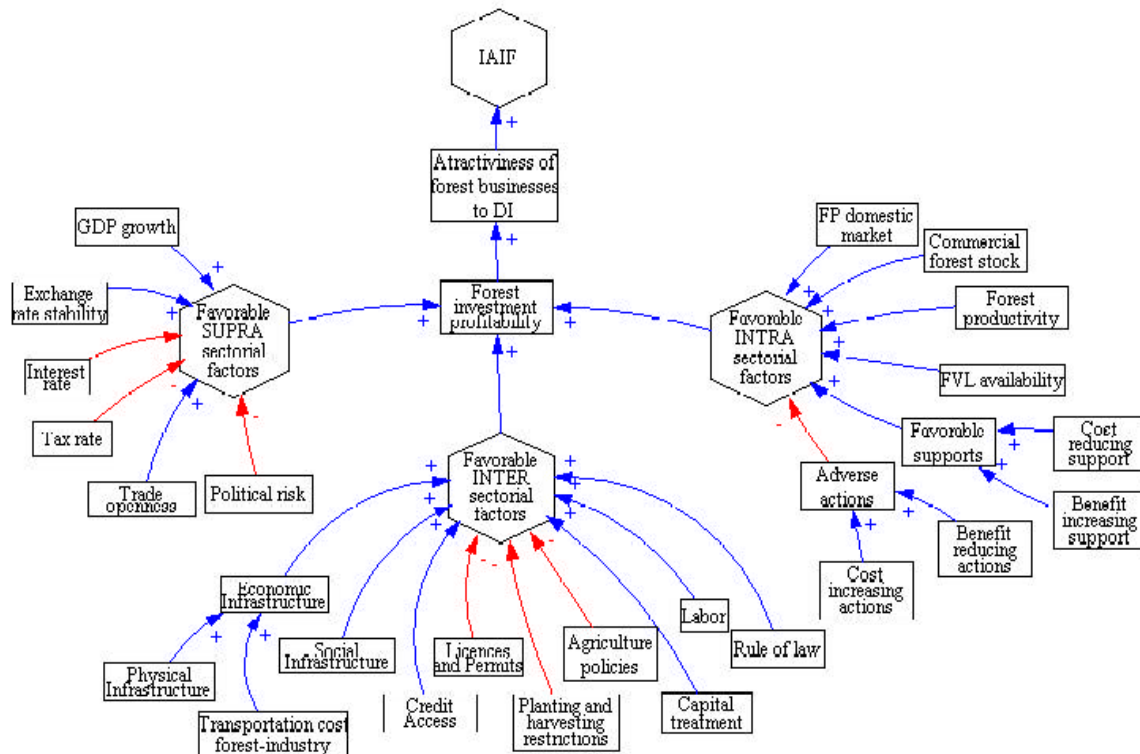


Factor	Sub index	Indicator	Concept	Source
GDP	SUPRA	GDP Growth Rate	Level of economic growth	World Bank
Interest Rate	SUPRA	Passive Real Interest Rate	Capital costs	CEPAL
Exchange Rate	SUPRA	Exchange Rate Stability	Exchange rate stability	PRS Group
Foreign Trade	SUPRA	Trade Openness	Level of openness to international trade	Fraser Institute
Political Stability and Government Transparency	SUPRA	Political Risk	Level of political and social stability	PRS Group
Tax Burden	SUPRA	Tax Share of GDP	Impact of taxes on economic activity	World Bank
Economic Infrastructure	INTER	Economic Infrastructure	Level of development and quality of road, sea and air transportation infrastructure, as well as Forest-industry transportation costs	FEM and STCP
Social Infrastructure	INTER	Social Infrastructure	Level of human development	UNDP
Licenses & Permits	INTER	Licenses & permits	Legal and bureaucratic obstacles to start a business	Heritage Foundation
Labor	INTER	Labor	Labor regulations, productivity, training and wage level of workers	World Bank and UNDP
Access to Credit	INTER	Capital Market	Sophistication of financial market, access to loans and credit, and local securities market	FEM and STCP
Legal Safety and Law Enforcement	INTER	Property Rights	Legal abandonment of property rights and lack of law enforcement actions by the government	Heritage Foundation
Capital Market	INTER	Capital Flow & Foreign Investment	Barriers and restrictions to foreign investment	Heritage Foundation
Agricultural Policies	INTER	Agricultural Policies	Impact of cattle raising and harvesting policies on the profitability of forest/industrial enterprises	Interviews
Planting & Harvesting Restrictions	INTER	Planting & Harvesting Restrictions	Perception of costs and risks associates to specific environmental regulations	Interviews
Forest Resource	INTRA	Forest Resource	Surplus and stock of wood for commercial purposes	FAO
Favorable Support	INTRA	Favorable Support	Support activities that reduce the forest/industrial business costs, while increasing their benefits.	Interviews
Domestic Market	INTRA	Domestic Market	Domestic consumption of forest input and products (includes export)	FAO
FVL	INTRA	FVL	Legalized FVL available for business	FAO
Adverse Actions	INTRA	Adverse Actions	Degree of adversity of actions that increase costs and reduce the benefits of forest/industry enterprises.	Interviews

Based on the concept that the indicator intends to measure, Chart A12 presents the causal relationship between the factors and the IAIF. The arrows (+) and (–) represent, respectively, a directly and inversely proportional relationship

among the connected elements. Thus, a change in one of the elements will cause a chain reaction, and will have impacts in the direction pointed by the arrows.

Chart AI.2: The factors and IAIF – a causal relationship



In order to simplify comparison process for the IAIF components, data were normalized and converted into a scale from 0 to 100, in which the higher the normalized value, the greater its contribution to the IAIF.

Besides, the normalization used preset maximum values (upper value) and minimum values (lower value) based on a global comparison scale that was built upon historical data. This allows the comparison of the normalized results, as well as the sub indexes results and the IAIF itself, over the years.

Where the factors for which there was a negative relationship between the indicator and the corresponding factor or the sub index affected, that is, when a high value associated to the indicator hinders the attractiveness level of the investment, results had to be inverted.

The results for the SUPRA, INTER and INTRA sectorial sub indexes were obtained through the arithmetic mean of data corresponding to the sub index-related indicators.

Finally, in order to assign greater importance to the INTRA sub index indicators, which are intrinsic to forest activity, and to the INTER sub index indicators, which are particularly related to the profitability of direct investments in the forest sector, the IAIF sub indexes were weighted.

The weighting was used only on the sub indexes, assuming that all indicators had the same weight. Thus, weight “1” was used for the SUPRA sub index, weight “2” for the INTER sub index, and weight “4” for the INTRA sub index.

## IAIF-derived calculations

### a) Potential

The calculation of the potential value is based on the estimated maximum score each country could have for each one of the IAIF indicator, given its limitations in terms of land, forest area, economic, etc. Considering such maximum values and using the same calculation methodologies that were used for the IAIF, one can calculate the potential value of this sub indexes and of the IAIF itself. The potential value reflects the maximum achievable score for that country in the indicators, sub indexes and IAIF itself, on the process of improving the business climate for forest investment

### b) Differential

The differential value is the absolute difference between the potential values and the actual values assigned to indicators, sub indexes and to the IAIF for a specific year.

Here is the formula for calculating the differential value:

$$V_{\text{differential}} = V_{\text{potential}} - V_{\text{actual}}$$

Where  $V_{\text{potential}}$  is the potential value of the indicator, subindex or IAIF, and  $V_{\text{actual}}$  is the actual value of the indicator, subindex or IAIF for a specific country in a given year.

### C) Growth potential

The growth potential represents the maximum growth percentage of the actual value of the indicator, sub index or IAIF for a specific country in a given year. It is the relative difference between the potential and actual value of indicators, sub index and IAIF for a given year.

$$PC = (V_{\text{potential}}/V_{\text{actual}} - 1) \times 100$$

Where  $V_{\text{Potential}}$  is the potential value of the indicator, subindex or IAIF, and  $V_{\text{actual}}$  is the actual value of the indicator, subindex or IAIF for a specific country in a given year.

### d) Contribution to IAIF

#### (i) Actual contribution

Once the IAIF is the weighted average of the sub indexes, which, in turn, are a weighted average of the indicators, the differential values of indicators and sub index do not represent their contribution for IAIF composition.

In order to calculate such contributions, the corresponding weights must be considered.

Here is the formula used to calculate the actual contribution:

$$CE = [(V_{\text{actual}} \times W) / n] / S$$

In the calculation of the actual contribution of an indicator,  $V_{\text{actual}}$  is its actual value,  $W$  is the respective weight in the sub index calculation value formula,  $n$  is the number of indicators that have been considered for the calculation of each sub index, and  $S$  is the sum of all such weights.



In the calculation of the actual contribution of a sub index,  $V_{\text{actual}}$  is its actual value,  $W$  is the respective weight in the IAIF calculation formula,  $n$  is the number of sub indexes that have been considered for the IAIF calculation (3), and  $S$  is the sum of all such weights (7).

The differential contribution represents the contribution of an indicator for the corresponding potential sub index or of the sub index for the potential IAIF.

For the calculation the differential contribution, the same formula used for the actual value calculation is used, replacing the actual value for the differential value (of the indicator or sub index).

Here is the formula used to calculate the differential contribution:

$$CE = [(V_{\text{differential}} \times W) / n] / S$$

In the calculation of the actual contribution of an indicator,  $V_{\text{differential}}$  is its actual value,  $W$  is the respective weight in the sub index calculation value formula,  $n$  is the number of indicators that have been considered for the calculation of each sub index, and  $S$  is the sum of all such weights.

In the calculation of the actual contribution of a sub index,  $V_{\text{differential}}$  is its differential value,  $W$  is the respective weight in the IAIF calculation formula,  $n$  is the number of sub indexes that have been considered for the IAIF calculation (3), and  $S$  is the sum of all such weights (7).

The following procedures have been adopted for data from secondary sources:

- a) Adopting reliable alternative sources, making sure the calculations involved in the indicator are consistent.
- b) Considering as the indicator the average of indicators for the other countries in the continent.

Where no data from primary sources, collected through questionnaires, were available, the IAIF results from previous years have been used.

In all cases, the procedure was submitted to detailed analysis.

## **Annex 12 - Acquisition of Rural Real Estate in Brazil**

Extracted from (MRE, 2012)

Under Brazilian law (Law No. 4,504/64), rural property ranges from rustic buildings to continuous areas, regardless of location, devoted to extractive activities, farming, cattle-raising or agro-industry, whether by the private sector or under public land tenure policies.

A foreign individual residing abroad cannot acquire rural property in Brazil. This restriction is not applied only in the case of legitimate succession (i.e., if the foreigner is called upon to acquire the rural property as a legal heir of the previous owner).

According to the laws currently in force, foreigners who have permanent residence in Brazil:

(i) Are free to acquire or lease one (1) rural property not exceeding three (3) modules for indefinite exploitation (MEI). The MEI is a unit of rural land established by the National Institute for Colonization and Agrarian Reform – INCRA for geographic areas sharing the same socioeconomic and ecological characteristics, according to the type of rural exploitation they are best suited for; and

(ii) Cannot acquire or lease rural real estate exceeding fifty (50) MEIs.

Similar restrictions to those applicable to foreign individuals with permanent residence in Brazil are applied to foreign legal entities.

The law provides that:

(i) Foreigners who have permanent residence in Brazil can only acquire or lease rural property for the purpose of implementing cattle-raising, industrial or settlement projects. In addition, in the case of foreign entities, such projects must be contemplated in their articles of association. These projects must be approved by the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) and, depending on the type of project (industrial, colonization, agricultural project, etc.), other federal government bodies in charge of the respective activities may be called upon to review the application as well; and

(ii) Congress must authorize the acquisition or lease of areas exceeding one hundred (100) MEIs.

Additionally, the total area acquired or leased by foreign entities or individuals must not exceed 25% of the total area of any given municipality. Also, foreigners of the same nationality (including foreigners who control Brazilian entities) cannot hold more than 40% of those 25% of the area of the municipality.





All the restrictions described above also apply to transfers of rural real estate as a result of transactions involving corporate restructuring (such as mergers, spin-offs, acquisitions, changes in corporate control, etc.).

Any transaction made in violation of the foregoing restrictions is null and void.

The President of Brazil may, by specific decree, authorize the acquisition of rural land beyond the provisions of the current law, in cases in which such property contributes toward priority projects under national development plans.

Acquisition of rural property by Brazilian companies with foreign equity control is a subject that has given rise to heated debates since mid-2010.

The 6th Constitutional Amendment of 1995 revoked article 171 of the Brazilian Federal Constitution, which provided for differential treatment to companies incorporated under Brazilian Law if they were Brazilian companies with Brazilian capital directly or indirectly controlled by individuals residing in Brazil or not, that is, with direct or indirect equity control held by foreigners. Since then, there has been no debate on the legality of Brazilian companies with foreign equity control acquiring rural property in Brazil.

However, the Federal Attorney General's Office issued an opinion in August 2010 arguing that article 1 of Law n. 5,709/71, which subjects Brazilian companies with foreign equity control to the same regime imposed on foreign companies, is consistent with the Constitution. After being approved by the President of Brazil, this opinion became mandatory for all agencies of the Federal Administration, which must comply with it strictly.

In this new scenario, Brazilian companies with foreign equity control are subject to the same regulatory framework as that imposed on foreign companies.

## Annex 13 - Useful Links

Organization	Link	Usefulness
<b>Federal government level</b>		
Ministry of Development, Industry and Foreign Trade – MDIC:	<a href="http://www.mdic.gov.br/sitio/">www.mdic.gov.br/sitio/</a>	Its function is to formulate, implement and evaluate public policies for the promotion of competitiveness, trade, investment and innovation in enterprises and the welfare of the consumers.
Brazilian Investment Information Network – Renai	<a href="http://www.investimentos.mdic.gov.br/">www.investimentos.mdic.gov.br/</a>	Its objectives are: to provide useful information to potential investors in making the investment decision process in Brazil; support federal and state structures in the development of activities aimed at promoting productive investments; joint investment facilitation measures in the country.
Brazilian Trade and Investment Promotion Agency - Apex-Brasil	<a href="http://www2.apexbrasil.com.br/">www2.apexbrasil.com.br/</a>	Promote Brazilian products and services abroad and attract foreign investment in strategic sectors of the Brazilian economy.
Plano Brasil Maior	<a href="http://www.brasilmaior.mdic.gov.br/">www.brasilmaior.mdic.gov.br/</a>	Government policy to promote innovation and productive consolidation of Brazilian industry.
Ministry of Finance	<a href="http://www.fazenda.gov.br/">www.fazenda.gov.br/</a>	The Ministry of Finance is the organ that basically takes care of the formulation and implementation of the Brazilian economic policy.
Ministry of External Relations – MRE	<a href="http://www.itamaraty.gov.br/">www.itamaraty.gov.br/</a>	Among its objectives are: international politics; diplomatic relations and consular services; participation in commercial, economic, cultural and technical negotiations with foreign governments and entities; programs of international cooperation and trade promotion.
Divisão de Investimentos (DINV) - MRE	<a href="http://www.itamaraty.gov.br/servicos-do-itamaraty/promocao-comercial">www.itamaraty.gov.br/servicos-do-itamaraty/promocao-comercial</a>	The Department of Trade and Investment Promotion is the relevant unit of the Ministry of Foreign Affairs to act in organization, direction and implementation of policies to promote Brazilian exports and attracting investment of the country's interest.
Brazilian Logistics & Planning Company – EPL	<a href="http://www.epl.gov.br/">www.epl.gov.br/</a> <a href="http://www.logisticabrasil.gov.br/">www.logisticabrasil.gov.br/</a>	is a state enterprise that aims to structure and qualify through studies and research, the logistic integrated planning process in the country, connecting roads, railways, ports, airports and waterways.
National Council of State Secretaries of Development, Industry and Trade – CONSEDIC	<a href="http://www.consedic.org.br/">www.consedic.org.br/</a>	The contact with agencies of the federal government and the legislature, in addressing Industrial Policy and Productive Development issues of the Country.
National Front of Mayors – FNP	<a href="http://www.fnp.org.br/">www.fnp.org.br/</a>	Is a Brazilian movement organized by mayors of several municipalities, is headquartered in Brasilia, Federal District, and aims to defend the interests of many municipalities.
Brazilian Forest Service – SFB	<a href="http://www.florestal.gov.br/">www.florestal.gov.br/</a>	Operates exclusively in the management of public forests by promoting its economic and sustainable use

Organization	Link	Usefulness
Brazilian Institute of Environment and Renewable Natural Resources – IBAMA	<a href="http://www.ibama.gov.br">www.ibama.gov.br</a>	Its main duties are to exercise the power of environmental police and execute the national environmental policy. Also responsible for environmental permitting, environmental quality control, authorization of use of natural resources and surveillance, environmental monitoring and control through
Ministry of Environment – MMA	<a href="http://www.mma.gov.br">www.mma.gov.br</a>	Promote the adoption of principles and strategies for knowledge, protection and restoration of the environment, the sustainable use of natural resources, the enhancement of environmental services and the integration of sustainable development in the formulation and implementation of public policies
Ministry of Agriculture, Livestock and Food Supply - MAPA	<a href="http://www.agricultura.gov.br">www.agricultura.gov.br</a>	Responsible for the management of public policies to stimulate agriculture, the promotion of agribusiness and the regulation and standardization of the sector related services.
Brazilian Agricultural Research Corporation - EMBRAPA	<a href="http://www.embrapa.br">www.embrapa.br</a>	Development of agricultural and livestock technologies
Brasília University - UnB	<a href="http://www.unb.br">www.unb.br</a>	University with forest related researches.
Goiás Federal University – UFG	<a href="http://www.ufg.br">www.ufg.br</a>	University with forest related researches.
Mato Grosso do Sul Federal University – UFMS	<a href="http://www.ufms.br">www.ufms.br</a>	University with forest related researches.
Mato Grosso Federal University – UFMT	<a href="http://www.ufmt.br">www.ufmt.br</a>	University with forest related researches.
Campina Grande Federal University – UFCG	<a href="http://www.ufcg.edu.br">www.ufcg.edu.br</a>	University with forest related researches.
Semi Arid Rural Federal University – UFRSA	<a href="http://www.ufersa.edu.br">www.ufersa.edu.br</a>	University with forest related researches.
Recôncavo da Bahia Federal University – UFRB	<a href="http://www.ufrb.edu.br">www.ufrb.edu.br</a>	University with forest related researches.
Pernambuco Rural Federal University – UFRPE	<a href="http://www.ufrpe.br">www.ufrpe.br</a>	University with forest related researches.
Rio Grande do Norte Federal University – UFRN	<a href="http://www.ufrn.br">www.ufrn.br</a>	University with forest related researches.

Organization	Link	Usefulness
Piauí Federal University – UFPI	<a href="http://www.ufpi.br">www.ufpi.br</a>	University with forest related researches.
Sergipe Federal University – UFS	<a href="http://www.ufs.br">www.ufs.br</a>	University with forest related researches.
Oeste do Pará Federal University – UFOPA	<a href="http://www.ufopa.edu.br">www.ufopa.edu.br</a>	University with forest related researches.
Acre Federal University – UFAC	<a href="http://www.ufac.br">www.ufac.br</a>	University with forest related researches.
Amazonas Federal University – UFAM	<a href="http://www.ufam.edu.br">www.ufam.edu.br</a>	University with forest related researches.
Amazonas Rural Federal University – UFRA	<a href="http://www.portal.ufra.edu.br">www.portal.ufra.edu.br</a>	University with forest related researches.
Pará Federal University – UFPA	<a href="http://www.portal.ufpa.br">www.portal.ufpa.br</a>	University with forest related researches.
Tocantins Federal University – UFT	<a href="http://www.uft.edu.br">www.uft.edu.br</a>	University with forest related researches.
Rondonia Federal University – UNIR	<a href="http://www.unir.br">www.unir.br</a>	University with forest related researches.
Espírito Santo Federal University – UFES	<a href="http://www.ufes.br">www.ufes.br</a>	University with forest related researches.
Lavras Federal University – UFLA	<a href="http://www.ufla.br">www.ufla.br</a>	University with forest related researches.
Minas Gerais Federal University – UFMG	<a href="http://www.ufmg.br">www.ufmg.br</a>	University with forest related researches.
Rio de Janeiro Rural Federal University – UFRRJ	<a href="http://www.ufrj.br">www.ufrj.br</a>	University with forest related researches.
São Carlos Federal University – UFSCAR	<a href="http://www.ufscar.br">www.ufscar.br</a>	University with forest related researches.
Viçosa Federal University – UFV	<a href="http://www.ufv.br">www.ufv.br</a>	University with forest related researches.
Vales do Jequitinhonha e Mucuri Federal University – UFVJM	<a href="http://www.ufvjm.edu.br">www.ufvjm.edu.br</a>	University with forest related researches.

Organization	Link	Usefulness
Santa Maria Federal University – UFSM	<a href="http://www.ufsm.br">www.ufsm.br</a>	University with forest related researches.
Paraná Federal University – UFPR	<a href="http://www.ufpr.br">www.ufpr.br</a>	University with forest related researches.
Santa Catarina Federal University – UFSC	<a href="http://www.ufsc.br">www.ufsc.br</a>	University with forest related researches.
Pampa Federal University – UNIPAMPA	<a href="http://www.unipampa.edu.br/saogabriel">www.unipampa.edu.br/saogabriel</a>	University with forest related researches.
Paraná Technological Federal University – UTFPR	<a href="http://www.utfpr.edu.br">www.utfpr.edu.br</a>	University with forest related researches.
<b>State government level</b>		
Goiás State Environmental Agency	<a href="http://www.semarh.goias.gov.br">www.semarh.goias.gov.br</a>	Coordination and formulation of state policies for the environment, water resources and biodiversity and forests. Deployment, management and administration of state conservation units
Brasília Environmental Institute	<a href="http://www.ibram.df.gov.br">www.ibram.df.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in DF.
Minas Gerais Environmental Agency	<a href="http://www.meioambiente.mg.gov.br">www.meioambiente.mg.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Minas Gerais.
Sao Paulo Environmental Agency	<a href="http://www.ambiente.sp.gov.br/">www.ambiente.sp.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in São Paulo.
Paraná Environmental Agency	<a href="http://www.iap.pr.gov.br/">www.iap.pr.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Paraná.
Mato Grosso Environmental Agency	<a href="http://www.sema.mt.gov.br/">http://www.sema.mt.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Mato Grosso.
Mato Grosso do Sul Environmental Agency	<a href="http://www.imasul.ms.gov.br/">www.imasul.ms.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Mato Grosso do Sul.
Bahia Environmental Agency	<a href="http://www.meioambiente.ba.gov.br/">www.meioambiente.ba.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Bahia.

Organization	Link	Usefulness
Santa Catarina Environmental Foundation	<a href="http://www.fatma.sc.gov.br/">www.fatma.sc.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Santa Catarina.
Rio Grande do Sul Environmental Agency	<a href="http://www.sema.rs.gov.br/">www.sema.rs.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Rio Grande do Sul.
Rio de Janeiro Environmental Agency	<a href="http://www.inea.rj.gov.br/">www.inea.rj.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Rio de Janeiro.
Espírito Santo Environmental Agency	<a href="http://www.meioambiente.es.gov.br">www.meioambiente.es.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Espírito Santo.
Pernambuco Environmental Agency	<a href="http://www.cprh.pe.gov.br">www.cprh.pe.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in PE.
Tocantins Environmental Agency	<a href="http://www.semades.to.gov.br">www.semades.to.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Tocantins.
Tocantins Nature Institution	<a href="http://naturatins.to.gov.br/recursos-florestais/">naturatins.to.gov.br/recursos-florestais/</a>	Promote the study and research experimentation in the field of environmental protection and control and the rational use of environmental resources in Tocantins.
Alagoas Environmental Institute	<a href="http://www.ima.al.gov.br/">www.ima.al.gov.br/</a>	Has jurisdiction over the entire territory of Alagoas and is responsible for implementing the state Environmental policy.
Paraíba Environmental Agency	<a href="http://www.sudema.pb.gov.br/">www.sudema.pb.gov.br/</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Paraíba.
Ceará Environmental Agency	<a href="http://www.semace.ce.gov.br">www.semace.ce.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Ceará.
Rio Grande do Norte Environmental Agency	<a href="http://www.idema.rn.gov.br">www.idema.rn.gov.br</a>	Public agency responsible for the environmental and water resources quality and the execution of environmental public policies in Rio Grande do Norte.
Minas Gerais Forest Agency	<a href="http://www.ief.mg.gov.br/">www.ief.mg.gov.br/</a>	Responsible for forest management and related activities in Minas Gerais.
Amapá Forest Agency	<a href="http://www.ief.ap.gov.br/">www.ief.ap.gov.br/</a>	Run the forest policy of the state of Amapá under the macro-development policies of the state.
São Paulo Forest Agency	<a href="http://iflorestal.sp.gov.br/">iflorestal.sp.gov.br/</a>	Acts managing conservation units in the state of Sao Paulo and conducting research for genetic improvement to increase productivity of pine resins

Organization	Link	Usefulness
Amazonas Agriculture and Forest Agency	<a href="http://www.idam.am.gov.br/">www.idam.am.gov.br/</a>	Provides Technical Assistance and Rural Extension services to farmers and rural producers in the State of Amazonas
Pará Agency for forest development	<a href="http://www.ideflor.pa.gov.br">www.ideflor.pa.gov.br</a>	Promote sustainable development of different forest segments, through policies and forest management in Pará
Bahia Association of Forest Based Companies	<a href="http://www.abaf.org.br">www.abaf.org.br</a>	Strengthen the forest sector of Bahia promoting its image and contribution to Bahia and Brazil, promoting policies and laws that support the activity.
Minas Gerais Forestry Association	<a href="http://www.silviminas.com.br">www.silviminas.com.br</a>	Represents the leading companies in the planted forests sector, including the largest steel and charcoal ferroalloys. Aims to strengthen the Minas Gerais forest sector
Mato Grosso do Sul Association of Producer and Consumers of Planted Forests	<a href="http://reflore.com.br/">http://reflore.com.br/</a>	Brings together leading forest based companies with headquarters or branch in Mato Grosso do Sul
Rio Grande do Sul Association of Forest based Companies	<a href="http://www.ageflor.com.br">www.ageflor.com.br</a>	Brings together and represents local companies of the production, processing and marketing of products and forest-based services sectors.
Paraná Association of Forest based Companies	<a href="http://www.apreflorestas.com.br">www.apreflorestas.com.br</a>	Brings together forest related companies and research institutions in Paraná.
Santa Catarina Association of Forest based Companies	<a href="http://www.acr.org.br">www.acr.org.br</a>	Represents the associated forest based companies in relations with the constituted powers and with other sectors of society.
São Paulo Association of Forests Producers	<a href="http://www.floresta.org.br">www.floresta.org.br</a>	Brings together organizations, associations and stakeholders in the development of forestry and environmental preservation.
Tocantins Associations of Afforestation	<a href="http://www.aretins.com.br/">www.aretins.com.br/</a>	The main objective of the Association is to defend the collective interests of companies that are dedicated to sustainable development based on planted forests in Tocantins. Still on its early stages of development at the date of this report.
Bahia fomentation agency	<a href="http://www.desenbahia.ba.gov.br">www.desenbahia.ba.gov.br</a>	Supporting businesses and income generation in the state of Bahia



Organization	Link	Usefulness
Minas Gerais Institute of industrial Promotion	<a href="http://www.indi.mg.gov.br">www.indi.mg.gov.br</a>	Supporting the industrial sector in the state of Minas Gerais
Investe São Paulo	<a href="http://www.en.investe.sp.gov.br/">www.en.investe.sp.gov.br /</a>	Promotion and facilitation of investments in the state of São Paulo
<b>Forest Businesses related non-governmental organizations</b>		
Adami	<a href="http://www.adami.com.br">www.adami.com.br</a>	Forest based company headquartered in Paraná. Its main activities are sawmill, paper and packaging
Ahlstrom	<a href="http://www.ahlstrom.com">www.ahlstrom.com</a>	Ahlstrom was established in 1851 in Finland and has over the centuries developed from a diversified conglomerate to a global high performance fiber-based company.
Amata	<a href="http://amatabrasil.com.br/">http://amatabrasil.com.br/</a>	Amata is the company that makes the bridge between the forest and the consumer market by providing certified wood, produced with environmental responsibility and origin warranty.
Aperam Bioenergia	<a href="http://www.aperambioenergia.com.br">www.aperambioenergia.com.br</a>	Aperam BioEnergy has its business oriented to production and marketing of charcoal, wood, seeds and seedlings from renewable eucalyptus forests in Minas Gerais.
Arauco	<a href="http://www.arauco.cl">www.arauco.cl</a>	Forest based company acting in five business areas: Forestry, woodpulp, timber, panels and energy.
Arcelor Mittal Bioflorestas	<a href="http://www.arcelormittalbioflorestas.com.br/">www.arcelormittalbioflorestas.com.br/</a>	Company of the ArcelorMittal Group, produces charcoal from renewable eucalyptus forests in two Brazilian states: Bahia and Minas Gerais, covering 16 municipalities distributed in five administrative regions.
Arjowiggins	<a href="http://www.arjowiggins.com.br/">www.arjowiggins.com.br/</a>	Began its activities in Brazil in 1977, joining the group Papel Simão in the Pulp and Paper Industry of Salto SA
Berneck	<a href="http://www.berneck.com.br/">www.berneck.com.br/</a>	Produces and sells wooden boards as MDP, MDF and HDF as well as Pine lumber and plantation Teak, 100% from planted forests.
Bignardi Group	<a href="http://www.bignardi.com.br/portal/">www.bignardi.com.br/portal/</a>	Bignardi Group, headquartered in São Paulo, is one of the major manufacturers of paper notebooks from Brazil and Brazil's largest manufacturer of recycled paper for printing and writing.
Brookfield Group	<a href="http://www.brookfieldbr.com/">www.brookfieldbr.com/</a>	Brookfield is a vertically integrated timberlands manager through all aspects of timberland investing with over 35 years of experience investing in and operating timberlands and timberland-related investments in Brazil. Brookfield is engaged in all the stages of investment, production and management of the timberland assets.
Bahia Specialty Cellulose	<a href="http://www.bahiaspeccell.com/en/">www.bahiaspeccell.com/en/</a>	Produces cellulose from reforested eucalyptus.

Organization	Link	Usefulness
TG Pactual	<a href="http://www.btgpactual.com/home_en/AssetManagement.aspx/Timberland">www.btgpactual.com/home_en/AssetManagement.aspx/Timberland</a>	TG Pactual brings more than 30 years of experience to the management of 1.7 million acres of commercial timberlands in Latin America, the USA, Europe and Africa, representing assets and commitments of nearly US\$3 billion.
Celulose Irani S.A.	<a href="http://www.celuloseirani.com.br/">www.celuloseirani.com.br/</a>	Company in the segments of Paper for Packaging and Corrugated Card for Packaging
Cenibra	<a href="http://www.cenibra.com.br/cenibra/english/">www.cenibra.com.br/cenibra/english/</a>	Paper pulp and Forestry based company. In July 2001, JBP became the only shareholder of CENIBRA. JBP is a group of Japanese companies with broad experience and corporate relations in Brazil.
Celulose Riograndense	<a href="http://www.celuloseriograndense.com.br/">www.celuloseriograndense.com.br/</a>	A part of CMPC group, is a Gaúcho company present in the international market of eucalyptus short fiber cellulose. It has a factory in Guaíba municipality.
Copapa	<a href="http://www.copapa.com.br/">www.copapa.com.br/</a>	Located in the northwest of the State of Rio de Janeiro, the Copapa is a company that uses recycled paper, semi-processed pulp and bleached pulp to manufacture 100% virgin tissue paper.
Duratex	<a href="http://www.duratex.com.br/en/Default.aspx">www.duratex.com.br/en/Default.aspx</a>	Duratex S.A. is the largest industrialized wood panel, metal fittings and sanitary ware manufacturer in the Southern Hemisphere.
Eldorado Brasil	<a href="http://eldoradobrasil.com.br/EN/">eldoradobrasil.com.br/EN/</a>	It is a Brazilian company with global operations, producing pulp. Its mill and plantation areas are in Mato Grosso do Sul state, Brazil, and it has the capacity to produce 1.5 million tons of pulp a year.
Eucatex	<a href="http://www.eucatex.com.br/en/">www.eucatex.com.br/en/</a>	Is a major manufacturer of laminate floors, wall partitions, doors, MDP and MDF panels, hardboards and paints and varnishes in Brazil. With 2,201 employees, it currently exports to 37 countries and owns three modern factories in Botucatu and Salto.
Facepa	<a href="http://www.facepa.com.br/">www.facepa.com.br/</a>	Paper manufacturer in North and Northeast of Brazil.
Fibraplac	<a href="http://www.fibraplac.com.br/en/">www.fibraplac.com.br/en/</a>	Fibraplac is a company of the Isdra Group. It is one of the country's most modern MDF plants and it is the only one in the state of Rio Grande do Sul. Located in the city of Glorinha, it has a production of over 500 thousand m³ a year.
Fibria	<a href="http://www.fibria.com.br/en/">www.fibria.com.br/en/</a>	Fibria is the global largest producer of eucalyptus pulp. The company has an annual production capacity of 5.3 million tons, with mills located in Três Lagoas (Mato Grosso do Sul), Aracruz (Espírito Santo), Jacaré (São Paulo), besides Veracel, a mill in Eunápolis (Bahia), in joint venture with Stora Enso. In partnership with Cenibra, it operates Portocel, in Aracruz, the only Brazilian port specialized in pulp shipments.
Floraplac Industrial Ltda.	<a href="http://www.floraplac.com.br/floraplac/english/">/www.floraplac.com.br/floraplac/english/</a>	The Floraplac Industrial Ltd. is installed in Paragominas since 1989 and has as main activity the manufacture of plywood.
Global Forest Partners LP	<a href="http://gfplp.com/">http://gfplp.com/</a>	GFP is an SEC-registered investment adviser with a 25 year record of delivering superior investment returns.

Organization	Link	Usefulness
Floresteca	<a href="http://www.floresteca.com.br/index.asp?idioma=ing">www.floresteca.com.br/index.asp?idioma=ing</a>	Floresteca is considered to be the largest private teak company in the world. Operating since 1994, it specializes in developing improved seeds, producing clonal seedlings, planting, managing, harvesting, processing and trading of certified teak and integrated management of forestry assets.
Gerdau	<a href="http://www.gerdau.com.br/default.aspx?language=en-US">www.gerdau.com.br/default.aspx?language=en-US</a>	Gerdau is the leader in the segment of long steel in the Americas and one of the main suppliers of special long steel in the world.
Guararapes	<a href="http://www.guararapes.com.br/eng/">www.guararapes.com.br/eng/</a>	Production of MDF and Plywood. The MDF line is expected to reach 550,000 m <sup>3</sup> a year.
Ibema	<a href="http://www.ibema.com.br">www.ibema.com.br</a>	One of the largest manufacturers of paperboard in Brazil.
Iguaçu Celulose	<a href="http://www.iguacucelulose.com.br/eng/index.htm">www.iguacucelulose.com.br/eng/index.htm</a>	The Company manufactures and trades pulp and paper. Its four industrial units, located in Paraná and Santa Catarina States, produce pulp, mechanical pulp, Paraná cardboard, papers and multiwall paper sacks.
International Paper	<a href="http://www.internationalpaper.com/BRAZIL/EN/index.html">www.internationalpaper.com/BRAZIL/EN/index.html</a>	In Brazil International Paper's production system is composed of two pulp and paper mills in Mogi Guaçu and Luiz Antônio, in São Paulo State, and a paper mill in Três Lagoas, Mato Grosso do Sul State. Together, the three mills produce paper for Brazil and export markets, in addition to products on the Chambril line for conversion and printing.
Klabin	<a href="http://www.klabin.com.br/en-us">www.klabin.com.br/en-us</a>	Paper producer and exporter, produces packaging paper and board, corrugated packaging and industrial bags in addition to selling timber in logs. With 16 industrial plants – 15 in Brazil and one in Argentina
Kimberly-Clark Brasil	<a href="http://www.kimberly-clark.com.br/Novo/">www.kimberly-clark.com.br/Novo/</a>	North American company, provides services in the hygiene and welfare sectors.
Grupo Lwart	<a href="http://lwarcel.com.br/site/en/group.asp">lwarcel.com.br/site/en/group.asp</a>	Headquartered in Lençóis Paulista, São Paulo State, the Lwart Group is a private held industrial conglomerate .Produces pulp from Eucalyptus..
MD Papéis	<a href="http://mdpapeis.com.br/">http://mdpapeis.com.br/</a>	Produces special papers to meet the industrial and graphic markets.
Companhia Melhoramentos	<a href="http://www.melhoramentos.com.br/v2">www.melhoramentos.com.br/v2</a>	Planting forests in units located in the municipalities of Camanducaia (MG), Braganca Paulista (SP) and Caieiras (SP), and manufacturing of high performance fibers, intended for manufacturers of paper card with its industry located in Camanducaia (MG)
Melhoramentos CMPC	<a href="http://www.melhoramentoscmpc.com.br/">www.melhoramentoscmpc.com.br/</a>	Produces disposable institutional papers.
Mili	<a href="http://www.mili.com.br/">www.mili.com.br/</a>	Operates in the cleaning and hygiene sector and its main products are: toilet paper, paper towels, napkins, disposable diapers and absorbents.

Organization	Link	Usefulness
Munksjö Group	<a href="http://www.munksjo.com/">www.munksjo.com/</a>	Operates in the pulp and paper market, producing specialty papers and other products.
MWV	<a href="http://www.mwv.com.br">www.mwv.com.br</a>	Operates in the packaging market.
OJI Papéis	<a href="http://ojipapeis.com.br/eng/">http://ojipapeis.com.br/eng/</a>	Produce different types of papers and related products, such as: printing and writing paper, newsprint paper, packing paper, pulp and specialty papers
Papirus	<a href="http://www.papirus.com">www.papirus.com</a>	Papyrus currently has 370 employees and a production of 90,000 net tons of paperboard, which are sold in Brazil and exports to countries in Europe, Asia, North America, Africa, and especially Latin America.
Pisa	<a href="http://www.pisa.com.br">www.pisa.com.br</a>	The Pisa is a newsprint mill in Brazil, in operation since 1984. Located in the municipality of Jaguariaíva in northern Paraná, is the local unit of the Chilean group Papers Bio Bio and has annual production capacity of 170 thousand tons.
Grupo Plantar	<a href="http://www.plantar.com.br/en/">http://www.plantar.com.br/en/</a>	It is able to perform all forestry activities, and its customers include pulp and paper, wood panels, iron and steel mills and pencil industries. Managing their own forests as well as others, the company now operates in seven Brazilian States.
Primo Tedesco	<a href="http://www.primotedesco.com.br">www.primotedesco.com.br</a>	Primo Tedesco S.A. is a manufacturer of pulp, kraft papers, recycled paper, corrugated boxes and industrial paper sacks. Its products are sold in the domestic market, the Mercosur, North America and Europe, and originate from its own renewable forest base
Ramires	<a href="http://www.ramires.com.br/">www.ramires.com.br/</a>	Operates in the automotive, forestry and real estate sectors in the states of Mato Grosso do Sul, Maranhão, Minas Gerais and São Paulo.
Resource Management Services	<a href="http://www.resourcemgt.com/">www.resourcemgt.com/</a>	Founded in 1950, RMS is a private timberland investment firm serving pension funds, endowments, foundations and family offices.
Grupo Santa Maria	<a href="http://www.santamaria.ind.br/">www.santamaria.ind.br/</a>	Located in Guarapuava, in south-central Paraná, Santa Maria stands out as an important business group, active in the fields of paper, energy and reforestation.
Santher	<a href="http://www.santher.com.br/">www.santher.com.br/</a>	The Santher - Paper Mill Santa Therezinha S / A, is dedicated to the production of paper for industrial use and others developed for specific markets.
Sonoco	<a href="http://www.sonoco.com/">www.sonoco.com/</a>	Global business with four segments: Industrial, consumer, protective solutions and Display and Packaging.
Stora Enso	<a href="http://www.storaenso.com">www.storaenso.com</a>	The Group has some 28 000 employees in more than 35 countries worldwide, and is a publicly traded company listed in Helsinki and Stockholm. Its customers include publishers, printing houses and paper merchants, as well as the packaging, joinery and construction industries.

Organization	Link	Usefulness
Sudati	<a href="http://sudati.com.br/">http://sudati.com.br/</a>	Based in Palmas (PR), the Group has four manufacturing units in Parana and Santa Catarina, accounting for about 30% of exports of plywood boards in the country.
Suzano	<a href="http://www.suzano.com.br/">www.suzano.com.br/</a>	Has participation in the pulp, paper and renewable energy industries, and activities in insurance, reinsurance and risk management, real estate development, environmental services, graphics industry and multi-channel communication.
SWM	<a href="http://swmintl.com/">http://swmintl.com/</a>	Offers engineered solutions for the tobacco industry worldwide.
Trombini	<a href="http://www.trombini.com.br/en/">http://www.trombini.com.br/en/</a>	Trombini is a company in the paper packaging segment in Brazil and in Latin America.
VM Tubes	<a href="http://www.vmtubes.com.br/">www.vmtubes.com.br/</a>	Founded in 1969, V & M FLORESTAL's main activity is the planting of eucalyptus forests from which to produce charcoal – one of the key inputs to Vallourec Tubos do Brasil S.A
Veracel	<a href="http://www.veracel.com.br/en/Home.aspx">http://www.veracel.com.br/en/Home.aspx</a>	The company is an integrated agro-industrial undertaking, operated by nearly 700 own employees and about 2,400 workers from specialized companies, ranging from eucalyptus planting to pulp final shipment.
Industria Brasileira de árvores Ibá	<a href="http://www.abraflor.org.br/en/">http://www.abraflor.org.br/en/</a>	The Brazilian Tree Industry (Ibá) is the association responsible for institutionally representing the planted tree production chain, from the field to the industry, before its main audience of interest.
Forest Investigation Society	<a href="http://www.sif.org.br">www.sif.org.br</a>	Aims to support the development of research and professional training in forestry
The Forest Science and Research Institute	<a href="http://www.ipef.br/english/">http://www.ipef.br/english/</a>	Is a non-profit association aimed at planning, implementation and coordination of actions and management of resources, intended to studies, analyses and researches in the natural resource area, focused on forest science.

## Annex 14 - Summary Table of Brazil's Forest Credit Lines 2013

Credit Line	Beneficiary	Goal	Interest Rates	Terms
FNE Verde	Farmers, their cooperatives and associations; Rural, industrial, agro-industrial and service delivery enterprises.	Sustainable Forest Management, Recovery of Permanent Protected Areas and Legal Reserves, Forestry, others.	<p><b>To investments including defrayal floating money:</b> Operations between January and June 3,53% per year Operations between July and December 4,12% per year</p> <p><b>To floating money, Defrayal or isolated commercialization:</b></p> <p><b>-In the rural sector:</b> Mini: 5% per year; small: 6,75% per year; small- medium: 7,25% per year; Medium: 7,25% per year; Big: 8,5% per year.</p> <p><b>-Other sectors:</b> Micro: 6,75% per year; small: 8,25% per year; small- medium: 9,5% per year; Medium: 9,5% per year; Big: 10% per year.</p>	<p><b>Fixed and mixed investments:</b> Up to 12 years, including 4 years grace period <b>Semi-fixed investments:</b> Up to 8 years, including 3 years grace period</p> <p><b>Those terms can be extended:</b></p> <ul style="list-style-type: none"> <li>- Up to 20 years (including 8 years grace period) for projects in the field of Forest, crop and livestock integration, agroforestry, recovery of degraded areas and renewable energy generation.</li> <li>- Up to 20 years (Including 12 years grace period) for projects in the fields of recovery of degraded areas with long maturation cycle.</li> <li>-Up to 16 years (Including 7 years grace period) for projects in the field of afforestation and reforestation.</li> </ul>
FCO programa ABC Nature conservancy	Farmers (Physical and Legal Persons), their cooperatives and associations.	Sustainable Forest Management, Recovery of APP and RL, Forestry, others.	<p><b>Defrayal:</b></p> <ul style="list-style-type: none"> <li>- Mini: 5% per year; small: 6,75% per year; small-medium: 7,25% per year; Medium: 7,25% per year; Big: 8,5% per year</li> <li>-Forestry operations aiming at recovery of degraded legal reserves: 4% per year.</li> </ul> <p><b>Investment and associated defrayal:</b> Operations between January and June 3,53% per year Operations between July and December 4,12% per year</p>	<p><b>Investment</b></p> <ul style="list-style-type: none"> <li>-Afforestation and reforestation (sawmill): Up to 20 years and Grace period up to 10 years.</li> <li>-Reforestation for energy purposes: Up to 15 years, including 8 years grace period.</li> <li>- Recovery of degraded areas with timber and non-timber forest use.</li> <li>- Agroforestry and permanent cultures of rubber tree, mate herb, pequi and Brazil nuts: Up to 15 years with 8 years grace period.</li> </ul> <p><b>Project investment defrayal:</b> Up to 3 years with 1 year grace period Agricultural funding: Up of to 2 years (When it is the first funding in an transition project between conventional agriculture and agro ecology, the reimbursement is up to 6 years)</p>
FCO programa ABC Integration of Crop, Livestock and Forest	Farmers (Physical and Legal Persons), their cooperatives and associations.	Forestry, others.	<p><b>Defrayal:</b></p> <ul style="list-style-type: none"> <li>- Mini: 5% per year; small: 6,75% per year; small-medium: 7,25% per year; Medium: 7,25% per year; Big: 8,5% per year</li> <li>-Forestry operations aiming at recovery of degraded RL: 4% per year.</li> </ul> <p><b>Investment and associated defrayal:</b></p>	<p><b>Investment:</b> Up to 12 years, including 3 years grace period.</p> <p><b>Costs associated with investment project:</b> Up to 3 years with 1 year grace period.</p> <p><b>Machinery and equipment:</b> Up to 10 years, including 3 years grace period.</p>

Credit Line	Beneficiary	Goal	Interest Rates	Terms
			Operations between January and June 3,53% per year Operations between July and December 4,12% per year	
FNO Biodiversidade Support to sustainable projects	– Individuals and legal entities of private law in the rural sector; – Amazon's traditional societies not supported by PRONAF.	Sustainable Forest Management, Forestry, others.	Operations between January and June 3,53% per year Operations between July and December 4,12% per year  Performance bonus: 15% of the financial burden	<b>Fixed or mixed investments:</b> Up to 20 years, including 12 years grace period. <b>Semi-fixed:</b> Up to 10 years, including 6 years grace period.  <b>Defrayal and commercialization:</b> Up to 2 years.
FNO Biodiversidade Support to recovery of APP and RL	– Individuals and legal entities of private law in the rural sector; – Amazon's traditional societies not supported by PRONAF.	Recovery of APP and RL	–Investment operations or mixed investments between January and June aiming at investing: 3,53% per year –Investment operations or mixed investments between July and December aiming at investing: 4,12% per year –Operations destined only to defrayal: 4% per year, no performance bonus.  Performance bonus: 15% of the financial burden	<b>Fixed or mixed investments:</b> Up to 20 years, including 12 years grace period.  <b>Semi-fixed:</b> Up to 10 years, including 6 years grace period.  <b>Defrayal:</b> Up to 2 years.
FNO Amazônia Sustentável	Legal entities of private law, including individual companies, associations and cooperatives	Enable projects in the industrial segment of processing timber and non-timber forest products	–Investment operations or mixed investments between January and June aiming at investing: 3,53% per year –Investment operations or mixed investments between July and December aiming at investing: 4,12% per year –Defrayal operations aiming at recovering APP or RL: 4% per year, no performance bonus.  Performance bonus: 15% of the financial burden	<b>Fixed or mixed investments:</b> Up to 12 years, including 6 years grace period.  <b>Semi-fixed:</b> Up to 10 years, including 6 years grace period.  <b>Defrayal and commercialization:</b> Up to 2 years.
Pronaf Floresta	Traditional farmers in the PRONAF program, including those in the “A”, “A\C” and “B” groups	Sustainable Forest Management, Recovery of APP and RL, Forestry, others.	1% per year.	<b>Agroforestry projects:</b> Up to 20 years, with 12 years grace period (Except farmers in the “A”, “A\C” and “B” PRONAF groups)  <b>Other projects:</b> Reimbursement up to 12 years with 8 years grace period.



Credit Line	Beneficiary	Goal	Interest Rates	Terms
Pronaf Agroecologia	Traditional farmers in the PRONAF program, including those in the “A”, “A/C” and “B” groups	Agroecological and organic production systems.	Operations Valued up to R\$ 10 thousand: 1% per year. Operations with values above R\$ 10 thousand: 2% per year	Up to 10 years, including 3 years grace period, this can be expanded to 5 years.
Pronaf Eco	Traditional farmers in the PRONAF program	Forestry and others.	Operations Valued up to R\$ 10 thousand: 1% per year. Operations with values above R\$ 10 thousand: 2% per year	<p><b>Forestry projects financed with FNO, FNE and FCO resources:</b> Up to 16 years and 8 years grace period.</p> <p><b>Other forestry projects:</b> Up to 12 years and up to 8 years grace period.</p> <p><b>Mini biofuel plant:</b> Up to 12 years and up to 5 years grace period.</p> <p><b>Other renewable energy and environmental improvement technologies:</b> Up to 10 years and up to 5 years grace period.</p> <p>Conservationist’s practices and soil fertility correction: Up to 5 years and up to 2 years grace period.</p> <p><b>Dendê Palm culture:</b> Up to 14 years and up to 6 years grace period.</p> <p><b>Rubber tree culture:</b> Up to 20 years, including 8 years grace period.</p>
Pronaf Semiárido	Traditional farmers in the PRONAF program, including those in the “A”, “A/C” and “B” groups	Coexistence Projects with the semiarid region, focused on the agroecosystems sustainability.	1% per year.	Up to 10 years, including 3 years grace period, this can be expanded to 5 years.
Pronaf Agroindústria	Traditional farmers in the PRONAF program, including those in the “A”, “A/C” and “B” groups, their cooperatives and associations	Deployment of small and medium-sized agro-industries; expansion, renovation or modernization of PRONAF beneficiaries agro-industrial units	1% to 2% per year.	Up to 10 years, including 3 years grace period, this can be expanded to 5 years.
BNDES Florestal	Legal entities of private and public law, individual	Sustainable Forest Management, Recovery	<b>Direct Operations:</b> (a) long term interest rate + (b) BNDES remuneration + (c) credit risk rate	<b>Afforestation and reforestation for energy purposes:</b> Up to 11 years.

Credit Line	Beneficiary	Goal	Interest Rates	Terms
	entrepreneurs, associations and foundations	of APP and RL, Forestry, others.	<b>Indirect Operations:</b> (a) long term interest rate + (b) BNDES remuneration + (c) Financial intermediation rate + (d) Accredited financial institution remuneration	<b>Forest management and degraded areas reforestation:</b> Up to 15 years.
BNDES Support to Environmental Investments	<ul style="list-style-type: none"> <li>– Companies with headquarters and administration in the country.</li> <li>– Individual entrepreneurs</li> <li>– Associations and Foundations</li> <li>– Legal entities of public law</li> </ul>	Regularization of APP and RL, Forestry and others	<b>Direct Operations:</b> (a) long term interest rate + (b) BNDES remuneration + (c) credit risk rate <b>Indirect Operations:</b> (a) long term interest rate + (b) BNDES remuneration + (c) Financial intermediation rate + (d) Accredited financial institution remuneration	Determined according to the paying capacity of the venture, company or economic group
BNDES Climate Fund Program: Renewable Energy	<ul style="list-style-type: none"> <li>– Farmers, their cooperatives and associations</li> <li>– Companies with headquarters and administration in the country</li> </ul>	Implementation of Biomass power generation projects(excluding sugarcane)	<b>Direct Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) credit risk rate <b>Indirect Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) Financial intermediation rate + (d) Accredited financial institution remuneration	Up to 15 years, including grace period, which will end in up to 6 months after the date of commercial operation of the project, not to exceed 8 years
BNDES Climate Fund Program: Charcoal	Companies with headquarters and administration in the country	Support investments aimed at improving the efficiency and sustainability of production of charcoal	<b>Direct Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) credit risk rate <b>Indirect Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) Financial intermediation rate + (d) Accredited financial institution remuneration	Up to 15 years, including grace period, which will end in up to 6 months after the date of commercial operation of the project, not to exceed 5 years
BNDES Climate Fund Program: Combating Desertification	<ul style="list-style-type: none"> <li>– Farmers, their cooperatives and associations</li> <li>– Legal entities of public and private law</li> <li>– Companies with headquarters and administration</li> </ul>	Forestry, Recovery of APP and RL and others.	<b>Direct Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) credit risk rate <b>Indirect Operations:</b> (a) Financial costs + (b) BNDES remuneration + (c) Financial intermediation rate + (d) Accredited financial institution remuneration	Up to 12 years, including a grace period of at least 1 month, which will end in up to 6 months after the date of commercial operation of the project, not to exceed 8 years

## Annex 15 - Glossary

Agricultural land	Refers to the share of land area that is arable, under permanent crops, and under permanent pastures. Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded. Land under permanent crops is land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee, and rubber. This category includes land under flowering shrubs, fruit trees, nut trees, and vines, but excludes land under trees grown for wood or timber. Permanent pasture is land used for five or more years for forage, including natural and cultivated crops. World Bank, 2014.
Agriculture based businesses	Include business related to the supply of inputs, farming, harvesting, distribution, shipping, storage, processing, advertising and selling of agricultural products such as cultivation of crops and livestock production.
Agriculture sector	That sector of the economy that involve agriculture based businesses and activities. It includes inputs, processing and wholesale distribution of forest, food, livestock, fiber, wood, animal feed, and fishery products. For FDI statistical purposes it includes agriculture, livestock, and related services; silviculture, forest exploitation and related services, and related services; fishery, aquaculture and related services; tobacco products, textile products, food and beverage products, leather, related products and shoes, wood products and pulp, paper, and paper products.
Agriculture use	Any use of land that involve the production of non arbustive plants, cattle and other animal production.
Agriculture vocation land (AVL)	Agriculture Vocation Lands are those that, due to their physical site feature such as soil, topography, and the rainfall it receives, do not require exceptional protective measures to avoid soil and water related negative externalities. AVL classification does not depend on the type of cover the land actually has, nor does it depend on the requirements it may have for agriculture crop or forest production. Therefore, lands with forest cover or use can still be classified as AVL if their physical features so indicate; while lands not covered with forest may not be AVL.
Agriculture, value added	Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Source: <a href="http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS">http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS</a> .
Agro-Ecological Zoning (AEZ),	A complex methodology that seeks to enable rational land-use planning, management and monitoring on the basis of an inventory of land resources, and an evaluation of biophysical limitations and potentials for specific crop production and crop production requirements. It tries to divide land into units with similar crop suitability, productivity potential and environmental impact.
Arable land (in hectares) i	Includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded. world Bank, 2014
Biological diversity	means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.*
Biological resources	<i>Includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. *</i>
Environmental Damage	Damage to environmental resources and its resulting degradation, adverse alteration or harm to the ecological balance.
Environmental Impact Study and Report (EIA/RIMA):	A study and respective report designed to evaluate changes in the physical, chemical and biological characteristics of the environment caused by any form of matter or energy resulting from human activities that could directly or indirectly affect the health, welfare and safety of the population.
Externalities	Changes in a third party's welfare that result from decisions taken by someone who does not take in consideration such changes. When these decisions result in increase of the third party's welfare, it is said that a positive externality or external benefit have been generated. When these decisions result in decrease of the third party's welfare, it is said that a negative externality or external cost have been generated
FDI	Foreign Direct Investment is net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum

	of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows in the reporting economy. World Bank.
Food security	A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
Forest area	is land under natural or planted stands of trees of at least 5 meters in situ, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens.. (The World Bank, 2013)
Forest Based activities	Include activities related to the supply of inputs, forestry, harvesting, distribution, shipping, storage, processing, advertising and selling of outputs produced in forests, natural or otherwise.
Forest based businesses	Include business involved in the supply of inputs, forestry, harvesting, distribution, shipping, storage, processing, advertising and selling of wood and non-wood outputs produced in forests, natural or otherwise.
Forest cover	An area ... <i>more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ.</i> (FAO, 2004)
Forest land	The set of FVL with and without forest cover plus AVL with forest cover.
Forest policies	Policies that seek to increase the contribution of forest lands to social welfare.
Forest sector	That sector of the economy that involves forest based businesses and activities.
Forest use	Any land use that involves a forest cover. It includes, for example, exotic or native species plantation forests, natural primary or secondary forests under management; agroforestry uses, arbustive fruit plantations, forest roads, firebreaks, recently harvested forests temporarily without forest cover and that will return to forest use, etc.
Forest vocation land (FVL)	Forest Vocation Lands are those that, due to their physical site features such as soil, topography, and the rainfall it receives, should be kept under forest cover or other sustainable land use if soil or water related negative externalities are to be avoided. FVL classification does not depend on the type of cover the land actually has, nor does it depend on the requirements it may have for agriculture crop or forest production. Therefore, lands with no forest cover or use can still be classified as FVL if their physical features so indicate; while lands covered with forest may not be FVL.
GDP (current USD)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. Source: <a href="http://data.worldbank.org/indicator/NY.GDP.MKTP.CD">http://data.worldbank.org/indicator/NY.GDP.MKTP.CD</a>
Genetic resources	... means genetic material of actual or potential value.*
Gross capital formation (% of GDP)	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." According to the 1993 SNA, net acquisitions of valuables are also considered capital formation. Source: <a href="http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS">http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS</a>
Gross fixed capita formation	Gross fixed capital formation is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain additions to the value of non- produced assets (such as subsoil assets or major improvements in the quantity, quality or productivity of land) realized by the productive activity of institutional units. Source: <a href="http://stats.oecd.org/glossary/detail.asp?ID=1171">http://stats.oecd.org/glossary/detail.asp?ID=1171</a>
Gross National Income (GNI)	GNI (formerly GNP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in current U.S. dollars.
In-situ conservation	... <i>means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.</i>
INTER sectorial factors	Those factors of the business climate that affect agriculture and forest based investments which have origin in other sectors of the economy such as economic infrastructure (energy, transport, communications), social infrastructure (water, sanitation, health, education), financial sector, environmental rules, land tenure, etc.
INTRA Sectorial factors	Those factors of the business climate that affect agriculture and forest based investments which have origin with these same sectors and whose policy interventions instruments are under the control of agriculture and forest governmental institutions, businesses, and related stakeholders.

Land area	is a country's total land area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes. (Food and Agriculture Organization; data are for 2011)
Land cover	The observed (bio) physical cover on the earth's surface, regardless of its use by people.
Land use	Refers to arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it.
Non-forest vocation lands (nFVL)	Agriculture vocation lands plus all other land surfaces such as urban areas, water bodies. Excludes forest vocation lands.
Pollution	Degradation in environmental quality resulting from activities that directly or indirectly affect the health, welfare and safety of the population. Any activity that can potentially pollute the environment or which use environmental resources must be registered with the Federal Technical Registry
Rural development	Is that type of development that takes places in rural areas. Encompasses agriculture, forestry education, infrastructure, health, capacity-building both for off- and on-farm employment, and rural institutions the needs of vulnerable groups. Rural development aims at improving rural people's livelihoods in an equitable and sustainable manner, both socially and environmentally, through better access to assets (natural, physical, human, technological, and social capital), and services, and control over productive capital (in its financial or economic and political forms), that enable them to improve their livelihoods on a sustainable and equitable basis.
Rural sector	That sector of the economy that takes places in rural areas and includes agriculture, forest, fisheries, livestock based economic activities as well as non-farm related economic activities taking place in rural areas.
SELIC	(Special Clearance and Escrow System) is the Brazilian Central Bank's system for performing open market operations in execution of monetary policy. The Selic rate is the Bank's overnight rate.
Soil or water related externalities	Externalities associated with the use of the soil and which are the result of erosive and water runoff processes. These externalities affect on-site soil plant nutrition and water availability for plant consumption, generate loss of soil particles that will be deposited as siltation elsewhere in the landscape, affect water percolation into the soil, the quality, quantity, and time availability of water on water bodies, and affect water availability in ground water and springs. The phrase excludes pollution resulting from agrochemical use.
Stakeholders	Individuals and groups who have an interest in the issues in hand. They normally represent their own interests as stakeholders.
SUPRA sectorial factors	Those factors of the business climate that affect all sectors of a country's economy such macro-economic factors, exchange rate, fiscal policy, etc.
Sustainable agriculture	Agricultural production activities that do not generate soil or water related negative externalities.
Sustainable land use	Land use of any type that does not generate soil or water related negative externalities. It can be a sustainable agriculture use, a road, a building, forest cover, forest use.
Terrestrial protected areas	are totally or partially protected areas of at least 1,000 hectares that are designated as national parks, natural monuments, nature reserves, or wildlife sanctuaries; protected landscapes and seascapes; and scientific reserves. It includes World Conservation Union-protected area categories I-VI. (United Nations Environmental Program and the World Conservation Monitoring Centre, as compiled by the World Resources Institute; data are for 2010)

## Annex 16 – Field trip

## Itinerary

Day	Location	Time and Activities	Transportation	Notes
<b>20 July (SUN)</b>				
Day	05:30 - Brasília airport arrival	-Check into hotel in Brasília, -Rest due to jet lag or Visit Brasília tourism sites (optional) -Prepare for field trip	Airplane from Korea; Taxi	Melia Brasil 21 hotel reservation; SHS Quadra 6 - Bl. B, D e F- Asa Sul, Brasília - DF, 70316-000 Phone:(61) 3218-4700
<b>21 July (MON)</b>				
Morning	Brasília	8:30-conversation with consultants in the hotel 11:00 - Visit Korean Embassy Check out hotel	taxi	
Afternoon	Brasília	14:30 Visit to the Brazilian Forest Service- (SFB) 16:30 Free	taxi	
Night	Brasília, Belo Horizonte	Air travel to Belo Horizonte	Taxi in Brasília; Rental car in Belo Horizonte	Hotel Promenade Lago Santa (Rua dos Operários, 735, Lagoa Santa, CEP 33400-000, Brasil) 8km from the Airport. Car Rental (www.localiza.com), Fiat Doblo 1.8 + Driver service
<b>22 July (TUE)</b>				
Morning	Belo Horizonte,	Check out hotel 8:50am - Administrative city (INDI. SEDE) 11:10 - meeting with AMS directors	Car rental	Administrative City <a href="http://www.cidadeadministrativa.mg.gov.br/">http://www.cidadeadministrativa.mg.gov.br/</a> INDI- Minas Gerais Institute for Integrated Development SEDE-Minas Gerais State Economic Development Secretariat; AMS - Minas Silviculture Association <a href="http://silviminas.com.br/">http://silviminas.com.br/</a> Rua Paraíba, nº 1352, Conj. 1305, Funcionários - CEP: 30.130-141 - Tel. (31) 3282-8811. Contato Antonio Tarcizo.
Afternoon	Sete Lagoas	14:30 - car trip to Sete Lagoas 15:00 - Visit to Pq Iron Factory (charcoal main consumer)	Car rental	<a href="http://www.siderterra.com.br">http://www.siderterra.com.br</a>
Night	Martinho Campos	18:30pm car trip to Martinho Campos 20:30pm Check in Hotel	Car rental	Hotel Duarte
<b>23 July (WED)</b>				
Morning	Martinho Campos and Nearby Regions	Leave hotel 8:00 ArcelorMittal Bioflorestas office for overall explanation Harvesting operations, charcoal plant, plantations.	Car rental	Vanderlan Bernardino dos Santos Gerente Operacional, ArcelorMittal BioFlorestas T 55 31 3219 1519   F 55 31 3222 7790   C 31 8713 5151 <a href="http://www.arcelormittalbioflorestas.com.br/">http://www.arcelormittalbioflorestas.com.br/</a> Arcelor Mittal Bioflorestas <a href="http://www.arcelormittalbioflorestas.com.br/">http://www.arcelormittalbioflorestas.com.br/</a>
Afternoon	Martinho Campos and Nearby Regions	14:00 SD Florestal Nursery SD Florestal Saw mill to Confins airport	Car rental	João Batista, Diretor S&D Florestal - <a href="http://www.sdflorestal.com.br/">http://www.sdflorestal.com.br/</a> Tel 037 99680037
Night	Belo Horizonte, São Paulo	20:00 air travel to São Paulo 21:30 Check in Hotel in Guarulhos	Taxi	Hotel Panamby
<b>24 July (THU)</b>				
Morning	Mogi Guaçu	5:00am travel to Mogi Guaçu 8:20 Company office for overall explanation 11:00 Nursery visit	Transfer Company	
Afternoon	Mogi Guaçu	Plantation site visit (harvesting, transportation)	Company car	
Night	Mogi Guaçu São Paulo	Return to Hotel	Transfer Company	Hotel reserved by Korean Comitive
<b>25 July (FRI)</b>				
Morning	São Paulo	Preparation for return to South Korea Check out hotel	Taxi	
Afternoon	São Paulo	Air travel to Korea		

## List of persons contacted during the mission

Date	Institution	Person contacted	Position	Email	Phone	Address
21/07/2014	Serviço Florestal Brasileiro	Joberto Veloso de Feitasr	Diretor	joberto.freitas@florestal.gov.br	61-20287249	SCEN - Av. L4 Norte, Trecho 2 Lote 4 BL. H
22/07/2014	Secretaria de estado de Agricultura, Pecuária e Abastecimento. Subsecretaria do Agronegócio	João Ricardo Albanez	Superintendente de Política e Economia Agrícola	joao.albanez@agricultura.mg.gov.br	31-39158601 31-39158500	Cidade Administrativa do Estado de Minas Gerais, Rodovia Prefeito Américo Gianetti, S/N, Edifício Gerais - 10º andar, Belo Horizonte, MG
22/07/2014	Secretaria de Estado de Desenvolvimento Econômico. Subsecretaria de Investimentos estratégicos	Bernardo Ramos Bahia	Assessor	bernardo.bahia@desenvolvimento.mg.gov.br	31-39167586 31-39153079	Cidade Administrativa do Estado de Minas Gerais, Rodovia Prefeito Américo Gianetti, S/N, Edifício Minas - 3º andar, Belo Horizonte, MG
22/07/2014	Instituto de Desenvolvimento Integrado de Minas Gerais - INDI	Marcelo Miranda	Gerente de Promoção de Investimentos	marcelom@indi.mg.gov.br	31-39152833 31-99569503	Cidade Administrativa do Estado de Minas Gerais, Rodovia Prefeito Américo Gianetti, S/N, Edifício Minas - 2º andar. Belo Horizonte, MG
22/07/2014	Associação Mineira de Silvicultura	Antônio Tarcizo de Andrade e Silva	Diretor-Superintendente	tarcizo@silviminas.com.br	31-32828811 31-32848505 31-99989568	Rua Paraíba, 1352, Conj. 1305 Funcionários. Belo Horizonte/MG
22/07/2014	Associação Mineira de Silvicultura	Igor Lopes Braga	Advogado	igor@silviminas.com.br	31-32828811 31-32848505 31-86512154	Rua Paraíba, 1352, Conj. 1305 Funcionários. Belo Horizonte/MG
22/07/2014	Siderúrgica Terra (SiderTerra)	Wagner Nogueira Vaz de Mello	Responsável pela Siderúrgica	wagnermello@siderterra.com.br	31-96198320 31-37765300	BR-040 KM 472. Sete Lagoas/MG
23/07/2014	AcelorMittal Bioflorestas	Vanderlan Bernardino dos Santos	Gerente Operacional	Vanderlan.Santos@arcelormittal.com.br	31-32191519 31-32227790 31-87135151	Av. Carandaí, 1.115 - 10º andar - Funcionários 30130-915 - Belo Horizonte - MG
23/07/2014	S&D Florestal	João Batista Dias	Diretor	joao.batista@sdflorestal.com.br	37-99680037	Rodovia MG 164 - Km 89, S/nº, Zona Rural Martinho Campos - MG
23/07/2014	S&D Madeiras	João Carlos	Coordenador Florestal	joao.carlos@sdflorestal.com.br	37-99023504	Rodovia MG 164 - Km 89, S/nº, Zona Rural Martinho Campos - MG
24/07/2014	International Paper	Bruno Mariani Piana	Supervisor de Excelência Florestal e Desenvolvimento Operacional	bruno.piana@ipaper.com	19- 9 97760707	Rodovia SP 340, Km 171, 13845-901, Mogi Guaçu - SP



## Selected Photos of visits.



Foto 1: Visit to the Brazilian Forest Service. Brasilia, July 21. From left to right: Dr. Freitas, Mr. Lee and Mr. Seo.



Foto 2: Visit to the Government of Minas Gerais. Minas Gerais, July 22. From left to right: Mr. Miranda, Mr. Ramos, Mr. Lee, Mr. Seo and Mr. Stock.



Foto 3: Visit to the Minas Gerais Forestry Association (AMS) . Minas Gerais, July 22. From left to right: Mr. Lee, Mr. Silva, Mr. Seo and Mr. Braga



Foto 4: Visit to Siderterra Steel Industry. Minas Gerais, July 22. From left to right: Mr. Lee and Mr. Seo.



Foto 5: Visit to AcelorMittal Bioflorestas. Minas Gerais, July 23. Drag Procedure



Foto 6: Visit to S&D Nursery. Minas Gerais, July 23. Eucalyptus Nursery.



Foto 7: Visit to S&D Saw Mill. Minas Gerais, July 23. Timber Processing



Foto 8: Visit to International Paper. São Paulo, July 24. Fellerbuncher harvesting trees.

Date: 21/07/2014

Company or Institution: Brazilian Forest Service (SFB)

Time of Arrival: 14:20

Received by: Joberto Veloso de Freitas (Director)

The Ministry of Environment (MMA), created in November 1992, aims to promote the adoption of principles and strategies for knowledge, protection and restoration of the environment, the sustainable use of natural resources, the enhancement of environmental services and the inclusion of sustainable development in the formulation and implementation of public policies, cross and shared, participatory and democratic manner at all levels and levels of government and society. The Brazilian Forest Service (SFB) was created as a part of the MMA aiming at the management of public forests concessions. SFB has the mission to promote economic and sustainable use of public forests.

Description of activities: An overview on the current status of forests in Brazil was taken. Official data provided by the SFB indicate that there are 308 million hectares of public forests in Brazil of which only half a million are in the concession program so far. On the other side, there are estimates of only 7 million hectares of forest plantations with commercial intent in the south and southeast of the country, indicating a great potential for growth.

It was explained that the main function of SFB is the management of public forests and the only way to explore the same, within the law, is through the concession system. The concession is made by a binding system. Foreigners can be forests concessionaires but only if they establish a company with headquarters in Brazil.

Finally, carbon credit projects were taken in consideration, with emphasis on REDD +. Joberto explained that most of the projects are in the private sector, since the federal government is still defining the national REDD + strategy.

Conclusions. The visit provided an overview on the situation of Brazilian forests and understanding of the government involvement in the sector. While not focusing on the main objective of the South Korean visit, it was an important step to understand Brazil as a possible location for investments in forests.

Date: 22/07/2014

Company or Institution: Government of Minas Gerais

State Secretary of Agriculture, Livestock and Supply

State Secretary of Economic Growth

Minas Gerais Integrated Institute of Development (INDI)

Time of Arrival: 08:50

Received by: João Ricardo Albanes (Superintendent of political and agricultural economy), Bernardo Ramos Bahia (Advisor to the superintendence of financing and investment), Marcelo Miranda (INDI Manager of investment promotion)

The three institutions are part of the government of Minas Gerais and are located in the administrative town. The three secretaries responsible for receiving and submitting encompass all sectors of government interested in attracting investments to the state forest

Activities. The presentation began with an institutional video demonstrating the qualities and potential of the state of Minas Gerais. The video addressed data and general indicators of the state as well as exalted proximity to markets, possibility of production draining, infrastructure and manpower available.

It was explained that the state of Minas Gerais has a vocation for agribusiness and today only 2.6% of the state is covered with commercial plantations. At the same time, 30% of the state is covered with pasture, many of which are in a degradation stage. The conversion of degraded pastures into commercial plantations





is a viable and extremely desirable situation. Thus there is a huge potential for the growth of plantations in the region. The Secretary of Agriculture, Livestock and Supply has elaborated a map of the state zoning areas with suitability for the planting of Eucalyptus, demonstrating that most of the state would be viable for the species, taking in consideration only the soil conditions.

The three government agencies were unanimous in suggesting not purchasing land in the state. Although feasible, there are several legal difficulties involved. It was suggested not to immobilize capital in land purchases, instead maintain capital for investment in other forest operations. To do so would be advisable to invest through partnerships with large companies or buying eucalyptus production already present in the state and investing in industries for wood processing. Once there is a real interest in making investment, INDI provides all the necessary support, identifying available land, offering legal solutions and locating partners.

It was said that the coal market is low due to decreased demand for pig iron. Therefore new plantations are not an interesting investment at this moment.

Finally, the ABC rural credit program was offered as an option for carbon credits. At government level is not yet possible to profit from carbon credits outside of rural credit.

Conclusions. The visit was very productive in order to understand what opportunities and challenges are in the state of Minas Gerais. A totally new approach to the investments in the state was presented. That would be in the form of partnerships, rather than buying land. Have capital to invest in forest operations, possibly in partnership with other companies, would be preferable than to immobilize capital in land purchase.

It also became clear that only some specific conditions, which are interesting to the state government could lead to a governmental cooperation. Such conditions involve investment in the modernization of regional industrial park through the creation of new industries or the strengthening of large companies already established in the region.

Another important point was that the market for pig iron is in low, therefore new plantations in the state are not recommended for charcoal production. The charcoal market was one of the main initial curiosities of the South Korean delegation.

Date: 22/07/2014

Company or Institution: Minas Gerais Forestry Association (AMS)

Time of Arrival: 11:20

Received by: Antônio Tarcizo de Andrade e Silva (Superintendent director)

Igor Lopes Braga (AMS Lawyer)

Founded in 2003, the Minas Gerais Association of Forestry (AMS) represents the leading companies in the planted forests sector, including the largest steel and ferroalloys of charcoal, and ventures in the segments of pulp and paper, panels and solid wood products industry.

Today, it serves the interests of industry and forestry producers, responsible for an environmentally sustainable activity that creates jobs in rural areas and effectively contributes to the country's economy.

Activities. The meeting was focused on practical terms of investments in the state of Minas Gerais. The need to set the amount that will be invested and the final destination of the plantation was emphasized so that the best conditions can be identified. According to information from the AMS, the north of the state is more conducive to forests aiming at producing charcoal while the south has a more developed market for pulp. It was emphasized that the primary potential of the state is charcoal.

According to AMS, the best strategy to plant in the state of Minas Gerais is to establish partnerships with companies or landowners, thus splitting the costs. In this sense, a viable alternative is the TIMO, which are groups that manage forest investments.

The AMS has 22 company members and could indicate possible partners from this group. The associated company participates in the investment providing the land, while the potential South Korean investor participates with the money. The legal basis for conducting a partnership of this magnitude is provided by AMS.

Conclusions. The meeting explained many practical terms in relation to investment in forests in the state of Minas Gerais. AMS has made itself available if there is a real interest in investments in the future.

Date: 22/07/2014

Company or Institution: Siderterra

Time of Arrival: 15:00

Received by: Wagner Nogueira Vaz de Mello (CEO)

The steel mill is located in the state of Minas Gerais, the second largest reserves of iron ore in Brazil. It meets national and international markets providing pig iron among other products.

The steel complex is installed in an area of 540,000 m<sup>2</sup>, with a building area of 30.000 m<sup>2</sup> and has a production capacity of 120,000 tons of pig iron per year. It is located in the BR 040, km 472, in the municipality of Sete Lagoas - MG.

Activities. The meeting began with a general explanation of the company, with a strong focus on social responsibility (job creation and improvements in communities near the plant). It emphasized the need for all Group plantations to be within the law due to constant government inspections and due to the commitment to the environment.

The steel mill operates with 100 furnaces that turn wood into charcoal. This charcoal is transported into the furnace where the transformation in pig iron occurs. It is straightforward processes that consists of loading the cars with charcoal and transport them into the furnace.

The importance of the location of the plantations is quite prominent since the main cost of the charcoal production is the wood shipping cost. Siderterra has an average shipping cost between USD 1-2 per mile traveled.

The preference for charcoal in the production of pig iron is due the fact that it is cheaper and more efficient than its competitors. However, right now, charcoal is struggling to compete with its substitute products, Siderterra believes that the gap between supply and demand will increase greatly in the next five years, opening up great opportunities for charcoal.

Conclusions. Although for the Korean mission to know a steel plant was not among the priorities, the visit was important to build a global view of the timber market in the state of Minas Gerais.

Date: 23/07/2014

Company or Institution: AcelorMittal Bioflorestas

Time of Arrival: 08:00

Received by: Vanderlan Bernardino dos Santos (Operational Manager), Pedro Felix Iasbik (Regional Manager)

ArcelorMittal BioFlorestas, a company from the ArcelorMittal Group, produces charcoal from renewable eucalyptus forests in two Brazilian states: Bahia and Minas Gerais, covering 16 municipalities distributed in five administrative regions. Its administrative headquarters are located in Teixeira de Freitas, in the extreme south of Bahia and Minas Gerais municipalities Martinho Campos, Carbonita, Dionísio and Juiz de Fora. This excursion visited the administrative headquarte in Martinho Campos/MG.

ArcelorMittal BioFlorestas has an area of 100 thousand hectares of eucalyptus plantations and 40,000 hectares of permanent preservation and legal reserve.

Activities. The presentation began by demonstrating the monitoring system of forests adopted at the company. The system is based on three cameras installed in observation towers covering the entire planted forest area which help to identify outbreaks of fire and unauthorized persons trying to enter. Following, an institutional video was presented focusing on social and environmental values adopted by the company.



Scheme of camera coverage

There was a presentation of average production costs, at the request of the south korean visitors. The costs presented were divided into production of wood costs and charcoal production costs, as shown in the scheme below.

Wood	Cost (R\$/m <sup>3</sup> )
Stumpage	14
Harvest	12
Shipping	15
Total	41

Wood/Charcoal Conversion      5m<sup>3</sup>/1 ton

Charcoal	Cost (R\$/Ton)
Wood cost	205
Carbonization	120
Oven maintance	15
Charcoal shipping	9
Administrative costs	55
Total	404

The average cost for planting one hectare of forest is R\$ 4,900 for the first cycle and R\$ 2,700 for the second.

After the presentation, the field visit occurred. One skidder and a Grapple Saw were seen in operation. The skidder can drag 8-9 m<sup>3</sup> of wood per drag while Grapple Saw cuts 39 m<sup>3</sup>. The second stage of the field visit was in the ovens to produce charcoal. There are 38 ovens, each with a capacity of 250 m<sup>3</sup>. The total average production is 18,300 m<sup>3</sup> / charcoal / month. A pilot project to generate electrical energy by burning the smoke generated from the wood burning was presented. The project is still in early stages and can now generate 50-55 kW power by burning the smoke from 6 ovens. The end of the morning was dedicated to visiting Eucalyptus plantations of different ages.

**Conclusions.** The visit provided an overview of the production costs of an eucalyptus forest in addition to demonstrating a large company operating in the sector. The importance of innovation to reduce costs and attract new investments also became clear by the example of the smoke burning project to generate electrical energy..

The Acellormittal BioFlorestas proved open to working in partnership with South Korean investors, alleging that they have lands that are still not being used.

Date: 23/07/2014

Company or Institution: S&D Florestal

Time of Arrival: 13:40

Received by: João Batista Dias (Director) and João Carlos (Forestry Coordinator)

Santos and Dias (S & D) is a forestry company that aims to produce energy. Their production units utilize all of its raw material from planted forests.

The branches of the company's operations include logging, charcoal production, and immunization of wood and production of clonal eucalyptus seedlings.

The visit took place at the nursery and unity immunization and wood processing.

**Activities.** The visit began, after a brief presentation, on the nursery for Eucalyptus clones production. There are six varieties of Eucalyptus developed there, where each array has a different type of use. The mother plants were shown first. These matrices are the origin of all clones produced and marketed by the nursery. After separating the parts of the matrices to be used in replication, the parts are planted by employees in specific tubes, already filled with suitable substrate. The nursery has 35 employees planting and each has an average productivity of 5500 clones planted.

After the planting phase, the individuals are transferred to the greenhouse where they receive constant fertilization, besides having temperature and humidity controlled. After this stage, the seedlings are transferred for an open spot to meet closer conditions to those found in the plantations fields. The entire process, from the replication of the matrix to the sale lasts 80-90 days.

The seedlings are sold to 15 states and the main buyers are Fibria, Suzano and El Dorado. The nursery has a total staff of 150 employees.

The second stage of the visit occurred in the wood immunization and sawmill unit. There are produced immunized wood for fences, wooden framed roofs, poles and others. The average production of immunized wood is 37.000 m<sup>2</sup> per year. Immunization is performed using CCA autoclave.

The timber is sawn in various sizes, specific to each type of final product that is desired.

**Conclusions.** The visit provided a general overview of the operation of a Eucalyptus nursery and the operation of a Timber processing unit. These two components of the wood production chain had not yet



been addressed on the trip and were important to understand the industry. The S & D proved open to future partnerships.

Date: 24/07/2014

Company or Institution: International Paper

Time of Arrival: 08:20

Received by: Bruno Mariani Piana (Forest Development and Operational Excellence Supervisor)

International Paper is one of the largest manufacturers of non-coated papers in the world. It's a company of North American origin and the visit took place in the Mogi Guaçu Pulp facility unit.

In operation since the 1960s, Mogi Guaçu was the first printing and writing paper mill acquired by IP in Brazil.

- Pulp production capacity – 400,000 tons a year
- Non-coated paper production capacity – 440,000 tons a year
- Paper machines – 4

Activities. The visit began with an institutional presentation, demonstrating the structure and functioning of the company. The company has 7.2 million hectares planted and its production is composed of 76.6% of Eucalyptus and 23.4% of Pine. Plantations can reach a productivity of 40,7 m<sup>3</sup> / ha / year and there is the goal to achieve 50 m<sup>3</sup> / ha / year in 2030.

The company has 491 own employees and 1057 outsourced. Altogether 13,000 ha are planted annually by the company.

There are currently 20,000 ha in a system of land owner assistance (Fomento), 9,000 ha in business partnerships, and 72,000 ha of plantations on their own land. In addition to the productive areas of the company keeps 29.000 ha of preserved areas.

The visit followed to the Eucalyptus nursery. The nursery has a productivity of 14 million seedlings per year and has 100 employees in an area of 4 ha. There are 300 matrices that are changed every three years. Each employee has an average productivity of 5000 seedlings per day. Planted clones follow the sequence: 30 days in the greenhouse, 10 days in the shade house, hardening and transportation to the field. The survival rate of planted seedlings is 98% in the field.

The last part of the visit occurred in a harvesting area where a fellerbuncher, a Skidder and a Grapple Saw were observed.

Conclusions. It was observed by the functioning of other important company in the forestry sector that has yet a different business system than the ones visited so far. The emphasis on process improvements to increase efficiency demonstrated how the forestry sector is very dynamic in Brazil and should always have innovations in development.

It was also possible to observe the harvesting of full grown trees by the fellerbuncher, a process that had not yet been seen by the visitors.